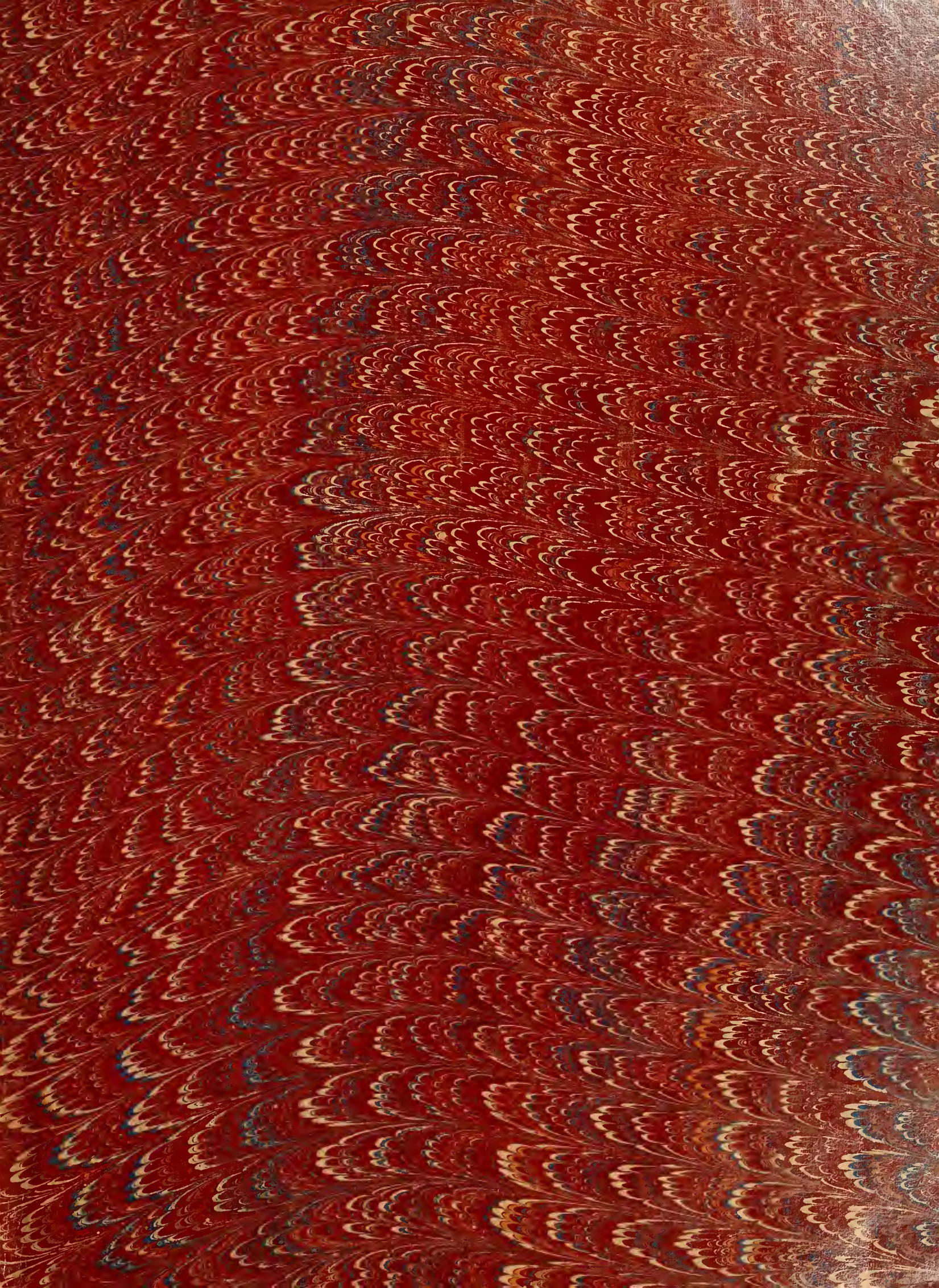




COLLECTION  
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TO THE  
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MCMV









RHOPALOCERA MALAYANA.

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# RHOPALOCERA MALAYANA:

A DESCRIPTION OF

## THE BUTTERFLIES

OF

## THE MALAY PENINSULA.

BY

W. L. DISTANT, M.A.I.

FELLOW OF THE ENTOMOLOGICAL SOCIETY OF LONDON; MEMBER OF THE ENTOMOLOGICAL SOCIETY OF FRANCE; CORRESPONDING MEMBER OF THE ENTOMOLOGICAL SOCIETY OF STOCKHOLM, AND OF THE BUFFALO SOCIETY OF NATURAL SCIENCES.

With 46 Coloured Plates and 129 Woodcuts.

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## PREFACE.



A DESCRIPTION of Malay Butterflies needs neither apology nor defence. All such publications appeal to two universal sentiments, the love of Nature—the keystone of the sense of beauty—and the love of Science\*—which is equivalent to man's innate craving after knowledge; and the first has frequently prompted the second, so that a mere collector of butterflies often develops into an excellent entomologist. There are three methods under which a faunistic study may be pursued, and these seldom appeal in an equal degree to the same worker. They may be described as the classificatory, in which the species and genera are analytically described and enumerated in their proper families or groups; the comparative, by which an analysis of different faunas affords the materials which support the generalisations as to geographical distribution; and the evolutionary or really biological method—often the first only—which seeks in embryonic development, and the peculiarities of surface colouring and markings to form some conception of how living animals came to have the forms and appearance which they possess. These methods are dependent on each other, and the most profound generalisations have been made by those who have done much of that pure and simple anatomical and classificatory work, † which by some theorists of the day, who would explain the problems of Nature from the revelations of their own inner consciousness, is looked upon as the amusement of a few unphilosophical pedants.

To understand these Malay butterflies, of which 503 species, arranged in 143 genera, are here described, and, with very few exceptions, figured, several preliminary positions require to be mastered, such as the physical dimensions and position of the area on which our fauna is found, the extent to which at present that fauna has been investigated, and what relationship it bears to the various insular and continental faunas which surround it.

To define our area is to commence our difficulties, for most faunistic works bear the name of a region which has not been thoroughly—often very imperfectly—explored by the collecting naturalist, and consequently we are sometimes only describing a part under the designation of the whole. This element of *partial* knowledge is very pronounced in 'Rhopalocera Malayana,' for though the Malay Peninsula may be described roughly as extending from the Isthmus of

\* The butterfly has frequently fulfilled an unscientific rôle, as in the notion of the "leyp-bya," or butterfly spirit of the Burman, a corrupt exerescence of Buddhism (*cf.* 'The Burman, his Life, and Notions,' by Shway Yoe, vol. ii. chap. xi). According to Friederich ('Die Symbolik und Mythologie der Natur') the butterfly was a symbol of death, as signifying the soul separated from the body; for which reason it was represented as sitting on an empty skull. One species was specially thought to announce disaster and a dry summer.

† As Darwin, who produced the 'Monograph of the Cirripedia,' and Huxley, Haeckel, Wallace, Bates, and others, who have all contributed much to the same class of Biological literature.

Kraih or the southern extremity of Tenasserim on the north, to Cape Romania, the Tanjungbulus, or "naked headland" of the Malays, in the south, including the many islands on the western and the less numerous islands on the eastern coasts;\* unfortunately the Zoology of the *whole* of this area† is unknown, and our information is almost entirely derived from the collections made at the different settlements along the western coast. It must therefore be remembered that our knowledge of the butterflies and other living animals of the Malay Peninsula is principally based on collections made at Kedah, Penang, Province Wellesley, Perak, Selangor, Sungei Ujong, Malacca, Johore, and Singapore; and although there is no reason to suppose that the fauna of the eastern portion of this narrow peninsula is much different from that of the western, there are probably still many local species to be found there, which will add considerably to our faunistic catalogues. ‡

In comparing an insect fauna with those of surrounding areas, the physical geography, geology, and botany of the different areas become factors of first importance in showing us not only the road by which much specific migration may have taken place, but also whether the surrounding conditions are capable of maintaining the emigrant species, and in an unmodified form. Now a study of the Rhopalocera of the Malay Peninsula gives unmistakable proof of the relationship both in genera and species to those of Burma and North-Eastern India on one side and to the islands of Borneo, Sumatra, and—in a less degree—to Java at its southern extremity. This is exactly what the physical geography and geology of the Peninsula would lead us to expect. As Logan has remarked, "it is directly united not only geographically but geologically with the continental mass, and, through the islands to the south and Sumatra on the west, a connection with the rest of the Malayan Archipelago can be established." § Of the classificatory details of the vegetation I do not possess sufficient knowledge to warrant an assertion, but we must remember—as Spruce truly remarks when speaking of the distribution of the Lepidoptera of the Amazon Valley—that it "can rarely correspond to the grander features of the vegetation, for the simple reason that the food of caterpillars is scarcely ever the foliage, &c., of the loftier forest trees, but chiefly of soft-leaved undershrubs and low trees, (1) which grow under the shade of the forest, and have, many of them, a restricted range, or (2) which spring up where the primeval woods have been destroyed, and in waste places

\* The reader who may wish to consult some of the best and original descriptions of the Peninsula may be safely referred to the 'Sketch of the Physical Geography and Geology of the Malay Peninsula,' by J. R. Logan (Journ. Ind. Archip. vol. ii. p. 83 (1848), the previously published chap. vii. of the first vol. of Newbold's 'British Settlements in the Straits of Malacca' (1839), and also the excellent compilation of Crawford in his 'Dictionary of the Indian Islands and Adjacent Countries,' p. 253 (1856). More modern accounts are often largely indebted to the above.

† Much ingenuity has been displayed in identifying the Malay Peninsula with the *Aurea Chersonesus* of the ancients, and many modern writers have adopted the view. Prof. Haeckel, however, states his conviction that "The Tarshish of the ancient Phœnicians and Hebrews can only have been Galle; the apes and peacocks, ivory and gold, which these navigators brought from the legendary Tarshish, were actually known to the old Hebrew writers by the same names as they now bear among the Tamils of Ceylon, and all the descriptions we derive from them of the much-frequented port of Tarshish apply to none of the seaports of the island, but the Rockpoint—Punto Galla" ('A Visit to Ceylon,' p. 173). On this subject one must cite the nameless commentator alluded to by Jortin, "who, explaining 1 Kings x. 22, *Once in three years came the navy of Tarshish, bringing gold and silver, apes, and peacocks*, says that by the *apes* we are to understand *heretics*" ('Remarks on Eccles. Hist.' vol. i. p. 143).

‡ As these pages are passing through the press, Mr. J. K. Birch has forwarded to me a specimen of the ubiquitous "Painted Lady," *Pyrameis cardui*, Linn., which he captured on Penang Hill.

§ Journ. Ind. Archipel. vol. ii. p. 90 (1848).

near the habitations of men, &c.”\* It appears, however, that the flora follows more or less the main features of the Rhopalocerous fauna, for Prof. Thiselton Dyer, with the knowledge acquired from the vast Indian Collection contained in the Kew Herbarium, has found that “there is a marked difference between the vegetation of the greater part of the Peninsula of Hindostan and that of the areas to the north and north-east of it. The latter belongs to the type characteristic of the Malayan region, which is also represented on the Malabar coast and in Ceylon.”†

Too little attention is often paid to the physical characteristics of a region which, qualifying the flora, greatly influences the nature of the insect fauna, and this doubtless will be clearly shown in the Malay Peninsula, when the central highlands have been more fully worked, and collections made there compared with those acquired on the alluvial coasts.‡ Even introduced plants will often add a corresponding diversity in insect life. Mr. Uhler found from an examination of the country in and around Denver in North America, particularly on the west side, that the common weeds of the eastern division of the continent had already established themselves there, and that, as was to be expected, many of the common insects dependent upon them were present in abundance.§

The material is not yet collected and tabulated by which the Rhopalocera of the Malay Peninsula can be thoroughly and analytically compared with that of Sumatra, Java, and Borneo; but our facts are sufficient to show that the Malay butterflies have their nearest relationship with those of Borneo—especially North Borneo;|| in a lesser degree with those

\* Journ. Linn. Soc., Zool., vol. ix. p. 352.

† Proc. Roy. Geograph. Soc. vol. xxii. no. vi. p. 25 (1878).

‡ This particularly struck the late Dr. Stoliczka when at the Nicobars, and he gave the following table, based on the information of Hochsetter, to illustrate the fact:—

GEOLOGICAL CHARACTER OF THE UNDERLYING ROCK.	CHARACTER OF SOIL.	RESPECTIVE CHARACTER OF VEGETATION.
1. Salt and brackish swamp, damp marine alluvium.	Swampy ground, not capable of cultivation.	Mangrove forest.
2. Coral conglomerate and coral sand, dry marine alluvium.	Fertile calcareous soil, principal constituents carbonate and phosphate of lime.	Cocoa-palm forest.
3. Coral conglomerate and coral sand, beside dry fresh-water alluvium.	Fertile calcareous sandy soil.	Large forest trees.
4. Fresh-water swamp and damp fresh-water alluvium.	Swampy ground, capable of being cultivated.	Pandanus forest.
5. Plastic clay, magnesian clay, marls and partially serpentine.	Not fertile, clayey soil, principal constituents silicate of alumina and silicate of magnesia.	Grassy plains.
6. Sandstone, slate gabbro, dry river alluvium.	Loose clayey sandy soil, rich in alkalies and lime, very fertile.	Jungle (the true primeval forest).

—(‘Stray Feathers,’ vol. ii. p. 44).

§ Bull. U. S. Geol. & Geogr. Surv. vol. iii. p. 355.

Mr. E. L. Layard has given a most interesting account of a similar occurrence:—“Many years ago, on my old magistracy at Point Pedro, in Ceylon, we had a very rainy season. Up sprang a flower I had not previously noticed in the north, the *Aristolochia indica*. Two beautiful insects, one a moth, the other a large *Papilio*, frequented it in the south of the island, both unknown in the north. I said to my wife, ‘Remember the marbled white; let us watch.’ True enough in due time I captured the *Papilios* hovering over it, and found the glorious caterpillar of the moth feeding on it. Whence had they come? They were unknown in the north! I believe from what I have experienced, that with insects a species may remain dormant in the egg, and even at the pupa state, for years, until some peculiar state of the atmosphere or other occult causes bring them out” (‘Field,’ June 9, 1877, p. 674).

|| I am greatly indebted to my friend Mr. W. B. Pryer for the opportunity—by the aid of his large collection—of forming a somewhat thorough acquaintance with the Rhopalocera of Northern Borneo.

respectively of Sumatra, Burma and the North-Eastern Indian districts,\* and in a still much less degree to those of Java and Ceylon. In fact, without some reference to the butterflies of Borneo, Sumatra, and North-Eastern India, a knowledge of those of the Malay Peninsula is as superficial as would be that of those of England when restricted and uncomparred with the Rhopalocera of the other portions of the Palearctic region. So closely are many of these Malay species allied to other surrounding local forms or species, that far more accuracy could have been attained had a larger and wider fauna been described. Thus, owing to the exigency of the case, I have treated *Euplœa dioeletianus* as a distinct species from the Continental Indian *E. rhadamanthus* and the Bornean *E. lowei*. Now had the Rhopalocera of the whole Indo-Malayan region been enumerated the identification would have been more philosophically as follows:—

*Euplœa dioeletianus*.

Var. a. *rhadamanthus*. Continental India.

Var. b. *dioeletianus*. Tenasserim, Malay Peninsula, Cochin China, Sumatra.

Var. c. *alcidice*. Java.

Var. d. *lowei*. Borneo.

This would point out to the student that he is dealing with a number of distinct local races, or, as might be better expressed, local phases of one dominant form or species. Through this cause the enumeration of a local fauna, such as of the Malay Peninsula, is necessarily narrow in principle, and lacks the philosophical breadth which raises descriptive Entomology to a true biological standard.

It is very satisfactory to find how many good observations are made by collectors abroad, and how much our knowledge is increased by not only their facts, but frequently also by their suggestions. It is not to be accepted as canonical, though frequently tacitly advanced, that all good work in entomological literature can only be done at home. The observer abroad is untrammelled by much of the obscurations of the Scribes and Pharisees found in our learned societies, and many a good naturalist has been spoilt by the jealousies and opposition of many who profess the same study as himself.† When one recalls the names of such observers as Humboldt, Darwin, Wallace, Bates, Belt, and Fritz Müller, Emerson's opinion of Thoreau is recalled: "he saw as with a microscope, heard as with ear-trumpet, and his memory was a photographic register of all he saw and heard." The study of butterflies does not consist only in a recognisable knowledge of their imago condition, but the egg‡ is a structure of wonderful diversity, and the larval or caterpillar condition affords a field of research of which the ground may be said to be only just broken. It would be in breeding that the writer—were he permitted to sojourn in the Peninsula again—would find his employment, and till the life-histories are worked out, and the egg and larval stages properly described and figured,

\* As found in the valleys and plains, and not above an height of 3500 or 4000 feet.

† It is not uncommon to find that the claim to have originally described a species, or to be acknowledged as the authority on some genus which no one else has studied, affords as much satisfaction as though the writer had created 'Hamlet' or written the 'Origin of Species.'

‡ A new classification of Rhopalocera, based on the structure of the egg, has just been proposed by Mr. Wm. Doherty (Journ. Asiat. Soc. Beng. vol. lv. p. 108 (1886).

the 'Rhopalocera Malayana' cannot be thoroughly studied, and this publication is simply an introduction to the subject. There is little doubt that when the Malay butterflies are carefully and systematically bred by some careful and accurate observer, many of the so-called species described in this volume will be found to be but seasonal forms of some other species, whilst, on the other hand, forms which we have degraded from specific rank on account of smallness in divergence of character, may show in larval conditions true specific differences. The standard of biological study, in a philosophical sense, has been wonderfully raised during the last few years, and entomological science has necessarily followed the same path.

The literature of the Rhopalocera has now been sufficiently long in the iconographic condition. There was a time when the importance of this description of work could scarcely be over-estimated, and the publications of Cramer and Drury may be said to have culminated in the beautiful works of Hewitson. The next epoch may be called the search for a classificatory or methodical arrangement. It began with the publication of the excellent and still valuable 'Genera of Diurnal Lepidoptera,' to which the names of Westwood, Doubleday, and Hewitson are attached, and eventually produced Mr. Kirby's 'Synonymic Catalogue,' a compilation which has been universally used, and which—in the opinion of the writer—has helped the study as much as any other single work yet published. We have now approached the critical and philosophical epoch in which curiosity as to the constituents of a fauna is submerged in the enquiry as to the derivation or evolution of that fauna. The key-note was struck when Bates eloquently remarked, as to the wings of butterflies, "that on these expanded membranes Nature writes, as on a tablet, the story of the modifications of species, so truly do all changes of the organisation register themselves thereon." \*

It now becomes my pleasant duty to gratefully acknowledge the assistance of those, who in one case was directly instrumental in this work being published, and in the other instances have helped to make it what it is, by reducing its errors and contributing information. 'Hamlet' without the Prince of Denmark, would be 'Rhopalocera Malayana' without the name of my friend D. Logan, of Penang. The inception of the publication is due to him; the clauses of our arrangement were very simple—I was to write as a labour of love, and he agreed to act as the financial Mæcenas. He has thoroughly fulfilled his obligation—I hope he may think that I have tried to do the same.

I also have to return thanks to the Army, the Navy, and the Church for much help on the spot. It was fortunate that the "Inniskillings" were quartered at Singapore, and I thus secured the assistance of Lieut. A. Mainwaring Goodrich and Paymaster Jno. Manners Kerr, whilst Capt. M. J. Godfery, of the Commissariat and Transport Staff placed me under no inconsiderable obligation, not only by the gift and loan of specimens, but also by the contribution of many original observations. A call made at Singapore by H. M. S. 'Penelope,' with that enthusiastic entomologist Mr. Gervase F. Mathew on board, naturally added to our knowledge; and that the Rev. L. C. Biggs has been Chaplain both at Malacca and Penang

\* 'Naturalist on the Amazons,' 3rd edit., p. 348. One is almost reminded of the words of Sir Thomas Browne, though alluding to "bees, ants, and spiders":—"Ruder heads stand amazed at these prodigious pieces of nature, whales, elephants, dromedaries, and camels; these, I confess, are the colossuses and majestick pieces of her hand; but in these narrow engines there is more curious mathematicks; and the civility of these little citizens more neatly sets forth the wisdom of their Maker" ('Religio Medici').

during this publication is a circumstance that cannot be too warmly acknowledged. Not only have I received many specimens direct from Mr. Biggs, but that veteran naturalist, Mr. P. H. Gosse,—who I am happy to say is still living, and naturally still working, at Torquay,—also placed in my hands the specimens he had previously received from Malacca through the same instrumentality. Mr. Durnford proved a tower of strength at Sungei Ujong, whilst Messrs. J. K. Birch and W. Egerton sent me several species not hitherto known to form part of the fauna. Herr Künstler has made large collections at Perak for various entomologists, and I have had the fortune to examine a considerable portion of these through the kindness of Dr. John Anderson, of the Indian Museum, Calcutta, Herr Ribbe, of Dresden,\* and Herr Georg Semper, of Altona, whilst Herr E. Honrath, of Berlin, has afforded me much information as to similar consignments. To Dr. Staudinger, of Dresden, I am indebted for the examination of a most valuable and interesting Malaccan collection, which contained many new species, whilst the collections and advice of Mr. F. Moore and Messrs. Godman and Salvin have been freely at my service. Mr. L. de Nicéville, of Calcutta, has found time—with his many engagements—to give me much kindly help, which has been thoroughly appreciated; whilst both Mr. W. F. Kirby and Mr. A. G. Butler have given me any assistance I required at the British Museum, the first-named having also contributed the General Index to this volume. To my artist, Mr. Horace Knight, thanks are also due for the careful way—regardless of trouble—in which he has drawn the figures, and without which the results of chromo-lithography would have been much less satisfactory.

The preparation of this publication has been the pleasure—in the scant leisure—of a busy man of other occupations during the last few years, commenced during ill health which threatened a speedy termination of all such undertakings, but which he is thankful to say has been removed. It has recalled again the scenes of other days, and reawakened that burning love of Nature which the tropics implant in the mind of any naturalist, and which tends to prove that he also belongeth to that order of things which is capable of endless modification, but which changeth not.

\* My attention has just been directed to a paper published in the 'Berliner Entomologische Zeitschrift' for 1885 (p. 225), in which Herr C. Plötz has described several species of *Hesperiidæ* collected by Künstler "anf Malacca (Perak)," and which are contained in the collection of Herr Ribbe. I am, however, to my regret, quite unable to identify these by the short descriptions given, and incline to the opinion that in some cases synonymy has been created.



# SYSTEMATIC LIST

OF

## FAMILIES, GENERA, AND SPECIES.

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# RHOPALOCERA MALAYANA.

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## Order LEPIDOPTERA.

### Suborder RHOPALOCERA.

*Rhopalocères*, Boisd. Spec. Gén. Lépid., i. p. 162 (1836).

THIS suborder includes the Butterflies as distinguished from the Moths, and is indicated by several characters which are common, but not invariable. The antennæ are more or less clubbed or thickened at the apex, except in the family *Hesperidae*, when they are generally hooked. The wings in repose are folded vertically over the back, thus exposing the whole of their under surface; but exceptions to this rule also occur, as in the case of the well-known *Ageronia feronia*, Linn., a butterfly which is somewhat abundant in the orange groves of Brazil, and whose habits have been recorded by Mr. Darwin and other naturalists and travellers.\* As a rule, also, these insects are diurnal in their flight, though a few are crepuscular in habit. However, the totality of these characters apply to the group, and the *Rhopalocera* may therefore, with such reservations, be described as possessing more or less clubbed antennæ, in flight diurnal, and in repose having the wings vertically folded above the back.

The proper arrangement and classification of the *Rhopalocera* long absorbed the attention of Lepidopteral systematists, and as a resultant many rival and somewhat artificial systems were promulgated, all, however, more or less based on thorough and exhaustive examination. In this way facts slowly accumulated, and these, with a clear estimation of the important natural affinities afforded by the form of the anterior legs, together with the development theory in the hands of Mr. Bates, supplied the rest. We now possess a good natural classification which is almost universally followed, and which, with some slight modifications, will be used in this work. It represents the transition from a butterfly, whose aerial nature is shown by possessing only four ambulatory feet, with its pupa suspended by the tail to a branch or other substance, through gradual and approximating stages, towards the moths, which have always six perfect legs, and whose pupæ are so frequently subterranean. Other systems of classification have been proposed, notably and almost concurrently with the above, by Herrich-Schäffer,† and since by Guénée,‡ Scudder,§ Constant Bar,|| and

\* In the Fam. *Hesperidae* the wings in repose are sometimes folded vertically; other species rest with the wings expanded horizontally; frequently the anterior wings are raised vertically, whilst the posterior ones remain in a horizontal position. See A. R. Wallace, 'Zoologist,' vol. xi., p. 3884 (1853).

† Corresp.-Blatt Zool.-mineral. Ver. Regensb. (1864).

‡ Statistique Scientifique du Département d'Eure-et-Loire, Lépidoptères. Chartres, 1875.

§ Trans. Amer. Ent. Soc., vi., p. 69 (1877).

|| Ann. Soc. Ent. France, Ser. V., t. viii., p. 5 (1878).

Rössler.\* A careful examination of these systems may with advantage and instruction be made, but I have not found it necessary to depart from the classificatory views of Mr. Bates.

### Fam. NYMPHALIDÆ.

*Nymphalidæ*, Bates, Trans. Linn. Soc. xxiii., p. 515 (1861). Journ. Entomol., i. p. 220 (1861); ii. p. 176 (1864).

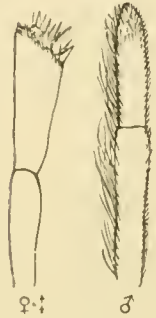


FIG. 1. Anterior tarsi of *Euplecta midamus*.



FIG. 2. Pupa of *Danais chrysipus*.  
(From Moore's 'Lep. of Ceylon'.)

Front legs imperfect in both sexes; in the female, at least, wanting the tarsal claws; in the male the fore tarsi quite rudimentary, consisting of one or two spineless joints. Pupa suspended freely by the tail.

This family corresponds with "The brush-footed butterflies or Nymphales" of Scudder,† and is placed at the head of the *Rhopalocera*, a position so long held by the *Papilionidæ*. In that family, however, both sexes are in the possession of six perfect legs, and the pupa is secured not only by the tail, but by a girdle across the

middle, characters which approximate towards those of the *Hesperidæ* and Moths. That the atrophy of the fore legs in the *Nymphalidæ* is a character that should elevate the family in rank, is well advocated by Scudder, who remarks:—"Now when we remember that this atrophy affects only the legs borne by the first segment of the thorax, and that this very segment, and this only, in passing from the low larval stage to the perfect form, has become greatly reduced in size, we must accept atrophy of *these* legs as a conclusive mark of high organization." The same author has also remarked, in reference to the suspension of the chrysalis by the tail alone being considered a stage beyond that of hanging by tail and girth, "We have clear proof that all the 'suspensi,' as Boisduval happily calls them, have passed through the stage of the 'succincti,' since *the straight ventral surface of the abdomen*, assumed perforce by the succincti, when they left the cocoon stage, and became attached to hard surfaces, *still remains in the chrysalis of the brush-footed butterflies, where it no longer serves any purpose*—as clear and striking an indication that the suspensi outrank the succincti, as that the pupa is higher than the larva."

On the contrary, however, it must be stated that so accomplished an entomologist and naturalist as Mr. A. R. Wallace has strongly argued for the retention of the *Papilionidæ* at the head of the *Rhopalocera*, though he has since§ used the arrangement proposed by Mr. Bates; whilst our entomological Nestor, Prof. Westwood, still maintains that he sees "no reason or even advantage in removing the six-legged *Papilionidæ* from the head of the order, and substituting in their stead the *Nymphalidæ*, with their imperfect fore feet, advocated by the German writers, and servilely adopted by their English followers."||

\* Jahrb. nass. Ver. für Naturk., xxxi. & xxxii., p. 220—231. Wiesbaden, 1880.

† Trans. Amer. Ent. Soc., vi., p. 69 (1877).

‡ The male is represented by the sign ♂; the female by ♀.

§ Geogr. Distr. Anim.

|| Trans. Linn. Soc. Sec. ser., Zool., vol. i., p. 157 (1875).



## Subfam. DANAINÆ.

*Danainæ*, Bates, Journ. Ent., ii., p. 176 (1864).*Euplainæ*, Moore, Lepid. Ceylon, vol. i., p. 1 (1881).

Lower disco-cellular nervule of the hind wing perfect. Larvæ smooth, with fleshy processes. Fore-wing submedian nervure of the imago double at its origin.

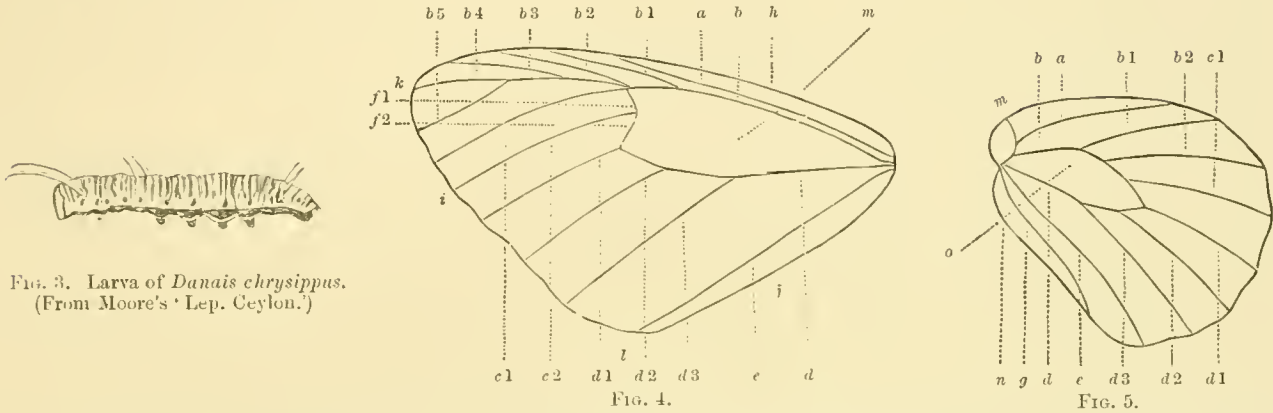


FIG. 3. Larva of *Danais chrysippus*.  
(From Moore's 'Lep. Ceylon'.)

FIG. 4.

FIG. 5.

FIG. 4. Anterior wing of *Euplaea phæbus*:—*a*, costal nervure; *b*, subcostal nervure; *b1*, *b2*, *b3*, *b4*, *b5*, subcostal nervules; *c1*, *c2*, discoidal nervules; *d*, median nervure; *d1*, *d2*, *d3*, median nervules; *e*, submedian nervure; *f1*, *f2*, disco-cellular nervules; *h*, costa or anterior margin; *i*, posterior or outer margin; *j*, inner margin; *k*, apex or anterior angle; *l*, posterior or anal angle; *m*, discoidal cell.

FIG. 5. Posterior wing (under side) of *Danais septentrionis*:—*a*, *b*, *b1*, *b2*, *d*, *d1*, *d2*, *d3*, *e*, *c1*, as in fig. 4; *g*, internal nervure; *m*, precostal nervure; *n*, abdominal or inner margin; *o*, discoidal cell.

This subfamily is divided into two groups the first of which only is found in, but not restricted to, the Oriental region, the other being peculiar to Tropical America.

This division of the *Danainæ* into two groups, corresponds to the proposals originally made and admirably argued by Fritz Müller,\* to some of whose conclusions we shall subsequently refer.

If we compare these two groups of *Danainæ*, or more roughly the *Danainæ* of the Old and New Worlds, we are at once struck with the fact that in each case there is a transition between more or less diaphanous winged butterflies, such as *Hestia* and *Ideopsis* (Oriental) and *Ithomia part* (Tropical American), on the one hand, and opaque or closely-scaled winged butterflies, on the other. Müller,† in discussing the progenitors of these groups, is inclined to the belief that the darker insects indicate the original marking and colouring; for he holds that if such progenitors had possessed wings with large transparent spaces, it is improbable that such a large number of the existing species should have reverted to a still earlier type of wing completely clothed with scales. This view is even more strongly evidenced in the Old World *Danainæ*.

## Group DANAINA.

*Danaina*, Godm. & Salv., Biol. Centr. Am., Rhopal., p. 1 (1879).

Male with a pair of anal pencils of hair; basal joints of palpi short; distal end of tarsus and tarsal joints of front leg of female flattened, so as to give a club-shaped termination to the leg; tibia of male as long as the femur; tarsus (in some form) always present.

\* 'Kosmos,' 1879, p. 100; and translation by Meldola, 'Proc. Ent. Soc.,' 1879, p. xx.

† Ibid.

This group, as here understood, contains, in addition to all the Old World *Danainæ*, two Tropical American genera. Five genera are here included, which with *Amauris*, peculiar to the Ethiopian region, and *Hamadryas*, not found west of Wallace's line, constitute the *Danainæ* of the extra-American regions as understood (with the exception of one additional genus, *Radena*) by all writers at the time of publication of Mr. Kirby's Catalogue in 1871, and as used by Mr. Wallace in his work on the 'Geographical Distribution of Animals.' Since that time many other genera have been proposed, some founded on Hübnerian names and others quite novel. These, although not all followed in this work, will be alluded to when placed under older generic names, and applying to Malayan butterflies.



FIG. 6.—*a*. Antenna of *Hestia lynceus*. *b*. Antenna of *Ideopsis daos*.

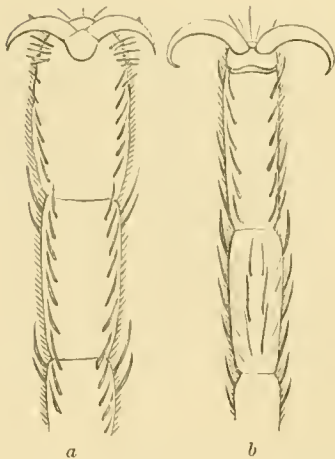


FIG. 7.—*a*. Intermediate tarsus of *Hestia lynceus*. *b*. Posterior tarsus of *Ideopsis daos*.

#### SYNOPSIS OF GENERA.

- I. Antennæ\* slender, almost filiform, scarcely thickened at the tip.
  - A. Wings semidiaphanous.
    - a*. Tarsal claws of middle and posterior legs, short and curved.
    - b*. Claws accompanied with pulvilli.
    - c*. First subcostal nervule of anterior wings anastomosing with costal nervule.
    - d*. Costal margin of hind wings strongly curved, subcostal nervules widely separated, the first short. HESTIA.
  - II. Antennæ gradually but distinctly clavate.
    - aa*. Tarsal claws of middle and posterior legs long and curved.
    - bb*. Claws with pulvilli obsolete or absent.
    - dd*. Costal margin of hind wings very slightly curved, subcostal nervules not widely separated and subequal in length.
    - e*. Hind wings more or less obovate. IDEOPSIS.
    - f*. Male with no specialised scent-gland.
  - B. Wings more or less opaque.
    - ddd*. Costal margin of hind wings nearly straight.
    - ee*. Hind wings broad, subtriangular. RADENA.
    - cc*. First subcostal nervule of anterior wings not anastomosing with costal nervule.
    - dddd*. Costal margin of hind wings nearly straight or slightly curved.
    - ff*. Males with one or more distinctly specialised scent-glands situated on posterior wings. DANAIS.
    - bbb*. Claws accompanied with pulvilli.
    - fff*. Males with no scent-glands to posterior wings, but sometimes with one or more pseudo-scent glands or brands on anterior wings. EUPLÆA.

\* Dr. Murray's contributors have carried back "antennæ" to 1698, when it is used apparently as a well-known term, in the 'Philosophical Transactions,' p. 377. Yet it is not given by Bailey in his vol. ii. (technical), 1731. It is a striking instance of how little is known of the history of words that no clue has yet been discovered to the author, date, or explanation of this curious application of a word meaning the "top-sail yard" of a vessel to the horn of an insect or lobster. It is not even known in what language the entomological use first appeared, and whether it was a popular figure or a scientific fancy. M. Littré did not raise the question which the editor of the Philological Society's Dictionary wants to solve.—'ATHENÆUM,' No. 2830, p. 95 (1882).

## Genus HESTIA.

- Hestia*, Hübn. Verz. bek. Schmett., p. 15 (1816); Doubl. Gen. Diurn. Lep., p. 94 (1847); Scudder, Proc. Am. Acad. Arts & Sc., x., p. 189 (1875).  
*Idea*, Fabr. Ill. Mag., vi., p. 283 (1808); Latr. Enc. Méth., ix., p. 10 (1819).  
*Nectaria*, Dalm., in Billb. Enum. Ins., p. 76 (1820); Scudder, Proc. Am. Acad. Arts & Sc., x., p. 224 (1875); Moore, Lep. Ceyl., i., p. 2 (1881).

Antennæ long, slender, almost filiform, scarcely thickened at apex. Wings large and semidiaphanous. Anterior wings lengthened, subtriangular; costal margin arched from base; apex broad and rounded; outer margin oblique and more or less sinuate; inner margin short and more or less concave. Costal nervure extending to more than half the length of costal margin; subcostal with first nervule emitted at some distance before end of cell and anastomosed with costal nervure. Cell long; upper discocellular nervule inwardly oblique and slightly angled near subcostal nervure, lower outwardly convex. Submedian nervure much recurved. Posterior wings elongate, more or less regularly obovate; costal margin strongly curved; apex and anal angle rounded; costal nervure short; subcostal nervules widely separated, the first short. Tarsi of the intermediate and posterior legs long, with the claws curved rather short, and provided with pulvilli.

Scudder has proposed the division of *Hestia*, as hitherto understood, into two genera,—*Hestia*, type *lynceus*, and *Nectaria*, type *idea*,—and Moore has adopted this view. But despite the assertion of Mr. Scudder that those two species are generically distinct, I cannot consider them so from my point of view, and therefore only follow all previous writers in recognising but one genus for these peculiar and beautiful butterflies.

According to Dr. Thwaites,\* the Ceylon species of the genus is known by the name of the “Sylph,” and frequents the glades of woods.† The Rev. L. C. Biggs, in a popular article on “Butterflies in Malaya,”‡ states that species of the genus are found in old jungle throughout the Straits, and are known by the name of the “Ghost.” The same author writes, “They are not usually very common, but may be seen in great numbers where their favourite honey can be gathered. This is usually at the top of a tree some thirty to fifty feet high.” When collecting in Province Wellesley myself, the colloquial term used was the “Widow,” and I saw the genus in greatest abundance on Penang Hill. Mr. Moore records that his *H. malabarica* is “found in woody places on the western coast, especially on the thick-wooded mountain-passes up the Western Ghats and Nilgiris.”

LARVÆ.—The only published figure of a larva of this genus is in Horf. and Moore’s Lep. Ins. Mus. E.I.C., i., pl. iv., fig. 11, where it is described, on the authority of Prof. Westwood,§ as being that of *Ideopsis daos*, Boisd. This is an error. The drawings were made by Capt. Hamilton, and Mrs. Hamilton, in a letter to my friend Mr. F. Moore (the contents of which that gentleman, with his usual kindness, has communicated to me) has informed him that they really represent the larva and pupa of the Malabar species of *Hestia*, *H. malabarica*, from specimens taken on the Western Ghats of Southern India. Mr. Moore has also since received verification of the same from other observers. As, however, that species is not found in our fauna, and its larva is the only one of which we have a published description, it would be hazardous to describe the same as of typically generic character.

\* Lep. Ceyl., i., p. 2.

† Tennent (Nat. Hist. Ceyl., p. 426) states that in Ceylon it is also known by the names of “Floater,” “Spectre,” and “Silver-paper-fly.”

‡ ‘Month. Packet,’ 1881.

§ Proc. Ent. Soc., n. s., i., pp. 35, 36.

PUPÆ.—The pupa of the above, and also of *H. belia*, Westw., a Javan species, is figured by Horsf. and Moore, *ibid.*, pl. iv., figs. 11a and 12.

The genus *Hestia* in the east, like the genus *Morpho* of the western tropics, may be taken as exhibiting what has been described as “excess of wing area,” which, with the comparatively small and light body, is more productive of lofty rather than of swift flight. Pettigrew, who has exhaustively treated on the mechanical properties of animal locomotion, has laid down the postulate that “The wing area decreases as the size and weight of the volant animal increases”;\* and the same author has not only shown a law of “weight necessary to flight,” but also that when the body is light and the wings very ample when they are driven at a comparatively low speed (both in insects and birds), “the reaction elicited by the ascent and descent of the wing displaces the body to a marked extent,”† or, in other words, an enormous expanse of wings or pinions readily explains an irregular flight on the “principle of recoil.” This principle applies to large-winged and light-bodied species of *Hestia*, who though of lofty, are not of swift flight. Bigg describes a Penang species as “a slowly sailing object,” which I can corroborate from my own experience; and Tennent,‡ writing of the Ceylon species, speaks of its wings “that bend and undulate in the act of flight,” by this sentence probably referring to the course of the whole insect.§ On the other hand, confining ourselves to the East, the more robust-bodied *Papilionide* have, as Collingwood has truly remarked, “strength of wing and straight headlong course.”|| This is particularly the case with the large and heavy-bodied *Ornithoptera*, of which *O. brookeana* may be taken as an example; Wallace, its discoverer, not only speaking of its swift flight, but Burbridge¶ stating that in that respect its flight resembles that of a bird.

Probably about sixteen species exist, although some of the described forms may prove to be but varieties of other species. The area over which this genus is distributed includes Continental India, Ceylon, Andaman Islands, Burma, Malay Peninsula, and extending also throughout the Archipelago, including Papua.

Only two species appear to be found in this fauna. Mr. Bigg remarks that “There are at least three distinct sizes of ‘Ghosts’ in the Straits.” In this enumeration he evidently includes the species of the following genus *Ideopsis*.

The food-plants being unrecorded, no knowledge of the geographical distribution of the same can be obtained.

### 1. *Hestia lynceus*. (Tab. I., fig. 2.)

*Pap. lynceus*, Drury, Ill. Ex. Ent., ii., t. 7, fig. 1 (1773).

*Idea lynceus*, Godt. Enc. Méth., ix., p. 195, n. 2 (1819).

Male and female. Wings semihyaline and more or less fuliginous; venation fuscous. Anterior wings above with the following black macular markings:—two contiguous spots above and a little before centre of cell, and a subquadrate costal spot at apex of first subcostal nervule; a large irregular spot about

\* ‘Animal Locomotion,’ p. 132.

† *Ibid.*, p. 119.

‡ Nat. Hist. Ceylon, p. 426.

§ Wallace speaks admiringly of a species of *Hestia* at Singapore, “sailing or rather floating along, and having, to my eye, a far more striking and majestic appearance than even the *Morphos* of Brazil.”—‘Zoologist,’ 1854, p. 4396.

|| ‘Rambles of a Naturalist,’ p. 182.

¶ ‘Gardens of the Sun,’ p. 260.

centre of cell, and a much angulated spot enclosing disco-cellular nervules; a large spot on each side of the base of the lower median nervule, followed by a discal oblique series of irregular spots, the upper two near costa fused and subquadrate, the remaining six more or less oblong or rounded, in straight oblique series between the nervules; a submarginal series of large duplex spots, terminating in a spot at end of each nervule, and a marginal series of pyriform spots. Posterior wing with a spot in centre of cell, and two beneath it, a discal series of eight irregularly rounded spots, two of which are between the costal and subcostal nervures, a submarginal series of large duplex spots, terminating in a spot at end of each nervule, but becoming irregular, much broken and partially effaced towards anterior angle, and a marginal row of pyriform spots. Head and thorax above black, spotted and streaked with white; abdomen black above, with the sides and under surface white; palpi beneath, undersides of trochanters and femora white; sternum black, broadly streaked with white. Underside of wings marked as above.

Exp. wings, 147 to 180 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca.—Sumatra (Brit. Mus.).—Java (colls. Brit. Mus. and Moore).—Borneo (colls. Brit. Mus. and Godm. & Salv.).

This species appears to be peculiar to, and dominant in, the true Malayan region. It is extremely variable in size and also in hue, the amount of fuliginous shading being inconstant, and some specimens are very much paler than the melanic form here figured. It also varies in the size of the black macular markings.

Two varieties have been elsewhere figured:—

Var. *a.* *Pap. idea*, Stoll (nec. Linn.), Suppl. Cram., t. 42, fig. 1 (1787—1791).

Var. *b.* *Hestia idea*, Doub. & Hew., Gen. Diurn. Lep., t. 13, fig. 1 (1847).

## 2. *Hestia linteata*. (Tab. II., fig. 1).

*Hestia linteata*, Butler, Trans. Linn. Soc., ser. 2, i., p. 536, pl. lxxix., fig. 6 (1879).

Male and female. Wings semihyaline, creamy white, neuration black. Anterior wing above with a pitchy basal costal streak, and the following black macular markings:—a much waved and angulated spot about centre of cell which reaches the subcostal nervure, and is contiguous to a smaller spot situated above that nervure; a large angulated spot, enclosing disco-cellular nervules; a large spot on each side of the base of the lower median nervule, followed by a discal oblique series of irregular spots, consisting of four suboval spots in a waved line situated between the nervules near apex, and a straighter more oblique and broken series on and between the median nervules; a submarginal series of duplex spots terminating in a thickened streak at end of each nervule, and a marginal series of obovate spots. Posterior wing with a spot in centre of cell, and two beneath it; a discal series of eight irregularly rounded spots, two of which are between the costal and subcostal nervures; a submarginal series of duplex spots terminating in a thickened streak at end of each nervule, which become exceedingly irregular, broken, and partially eradicated near anterior angle, and a marginal row of large obovate spots. Head and thorax above black, spotted and streaked with white; abdomen black above, with the sides and under surface white; palpi beneath, undersides of trochanters and femora white; sternum white, streaked with black. Underside of wings marked as above.

Exp. wings 145 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.).—Malacca (colls. Brit. Mus. and Moore).

*H. linteata* is allied to *H. belia*, Westw., a Javan species, to which Mr. Moore also compares his *H. malabarica* from S. India. It appears to be constant in form, and I have seen no dark specimens. It is probably quite confined to the southern portion of the Malay Peninsula.

## Genus IDEOPSIS.

*Ideopsis*, Horsf. & Moore, Cat. Lep. E.I.C., i., p. 133 (1857).

*Danais*, Sect. 4, Doubl. Gen. Diurn. Lep., p. 90 (1847).

Antennæ gradually but distinctly clavate. Wings semidiaphanous. Anterior wings lengthened, subtriangular; costal margin arched from base; apex broad and rounded; outer margin oblique and more or less sinuate; inner margin short and more or less concave; costal nervure extending to more than half its length; subcostal with first nervule emitted at some distance before end of cell and anastomosed with costal nervure. Posterior wings elongate, more or less regularly obovate; costal margin oblique and moderately straight; apex and anal angle rounded; costal nervure short; subcostal nervules not widely separated and subequal in length. Claws of middle and posterior legs long and slightly curved; pulvilli absent or obsolete. Male without sexual mark or scent-gland to posterior wings.

Larvæ and pupæ apparently undescribed.

About seven species of this genus are now known to exist, and its recorded area includes the Malay Peninsula, extending throughout the Archipelago to Waigiou and Mysore Islands. It has also been received from China. It is not found in Ceylon, and appears to be also absent from the lepidopteral fauna of the Nicobar and Andaman Islands. One species only is found in the Malay Peninsula.

Snellen, in writing on Celebesian butterflies,\* places one of the above seven species in the genus *Hestia*; the differential generic characters, however, here given, prevent my following that author in so doing.

1. *Ideopsis daos*. (Tab. I., figs. 3 ♂ & 4 ♀.)

*Idea Daos*, Boisd., Spéc. Gén. Léop., i., t. 24, fig. 3 (1836).

*Hestia Eudora*, Gray, Lep. Ins. Nep., p. 10, t. 9, f. 3 (1846).

*Ideopsis Daos*, Horsf. & Moore, Cat. Lep. E.I.C., i., p. 134 (1857).

*Idea Diardi*, Voll., Tijds. Ent., iii., p. 44, t. 2, f. 4 (1860).

Male. Wings semihyaline and more or less pale fuliginous; neuration dark fuscous. Anterior wings above with the costal area black, and with the following black macular markings:—a broad irregular patch at each subcostal nervule; a large spot at end of cell; a narrow streak at each discoidal nervure (sometimes coalescing); an oblique submarginal series of irregular spots, situated between the nervules, the lower three largest, and a marginal series of large spots, placed on the nervules, those at apex smallest; between the marginal spots are faint longitudinal streaks, and a thickened streak on apex of submedian nervure. Posterior wing with a large spot at apex of cell; a discal series of six irregular spots between the nervules (that near submedian nervure somewhat indistinct), and a marginal row of spots (at end of nervules these are somewhat obovate, and between which they are pyriform). Head and thorax above black, spotted and streaked with white; abdomen pale fuscous, white beneath; palpi beneath, undersides of trochanters and femora white; sternum black, spotted with white. Underside of wings marked as above.

Female. Differs from the male in having the anterior wings broader, and less deeply sinuate externally.

Exp. wings, ♂ 88 to 104 millim.; ♀ 92 to 112 millim.

\* Tijdschr. Ent., xxi., p. 5 (1878).

HAB.—Malay Peninsula; Penang (colls. Brit. Mus. and Moore); Province Wellesley (coll. Dist.).—Malacca (colls. Brit. Mus. and Moore); Singapore (coll. Brit. Mus.).—Sumatra (Gray).—Borneo (coll. Brit. Mus.).—China; Hong Kong (coll. Brit. Mus.).

This species, even in the male sex, varies much in the shape of the anterior wings, and affords thereby an illustration of the caution necessary before such a character can be used as of differential value in separating species.

The nearest allied species is *I. gaura*, Horsf., which inhabits Java, and which, with *I. daos*, I take as typical of the genus. These two species in colour and markings approximate closely to species of *Hestia*; the remaining species belonging to *Ideopsis* are more or less tinged with yellow, have the fuscous shadings broader, and approach the true Danaids.

NOTE.—Although Gray described this insect in his ‘Lepid. Ins. Nepaul,’ he gives the habitat Sumatra, which also applies to other insects in the same work.

### Genus RADENA.

*Radena*, Moore, Lep. Ceylon, p. 3 (1881).

Antennæ gradually but distinctly clavate. Wings more or less opaque, thickly covered with scales. Anterior wings subtriangular, somewhat elongate; costal margin slightly arched from base; apex broad and rounded; outer margin oblique and more or less sinuate; inner margin more or less concave. First subcostal nervule emitted at some little distance before end of cell, and anastomosed with costal nervure; second subcostal nervule emitted slightly before end of cell. Posterior wings broad, subtriangular; costal margin nearly straight; apex and anal angle rounded; costal nervure convex at base, and extending parallel to margin; subcostal nervules not widely separated, first arched and longest.

Male with no specialised scent-gland.

This genus is intermediate between *Danais* and *Ideopsis*. Agreeing thoroughly with the first in general appearance and coloration, it yet possesses no specialised scent-gland; while with *Ideopsis* it agrees in the position of the first subcostal nervule of anterior wing, but differs strongly from that genus by the shape of the posterior wings.

About ten described species or varieties are known, of unequal value, some showing strong specific differentiation, whilst others appear to be simply constant geographical races of one species; such as *R. vulgaris*, Butl., the only species received from the Malay Peninsula, which probably, as Mr. Wood-Mason\* considers, is but a constant local race or form of *R. similis*, Linn., a Chinese species, of which other constant and allied forms are found in Borneo, Nicobar Isles, and Ceylon. The last author, however, describes the male of his var. *nicobarica* as “provided with a distinct, though little specialised, sexual mark or scent-gland.” I have not seen that form, but from an examination of other species of the genus, have been unable to discover anything similar.

The area of this genus is of wide extent. Specimens of *R. vulgaris* labelled “Bengal” and “Nepaul” are contained in the British Museum; but Mr. Wood-Mason, writing from the Calcutta Museum,† considers this a mistake, and states that he has seen no specimen of it from any region farther to the west than Upper Tenasserim. We ought therefore to accept

\* Journ. Asiat. Soc. Bengl., vol. L., p. 226 (1881).

† Ibid.

Continental India as a questionable habitat at least; but *Radena* is represented in, and has been recorded from, Ceylon, Nicobar Islands, Malay Peninsula, Java, Borneo, Batchian, Gilolo, Bouru, and Ceram in the east, and northward from Siam, Formosa and China.

The larva and pupa of *R. juvena*, Cram., from Java, are figured in Horsf. and Moore's 'Cat. Lep. Ins. Mus. E.I.C.,' i., pl. v., figs. 4 and 4a, and Dr. Horsfield (p. 123) states that the larva there feeds on a plant bearing the native name of "Simbukan-rambat."

### 1. *Radena vulgaris*. (Tab. I., fig. 8.)

*Danaïs vulgaris*, Butl., Ent. Month. Mag., xi., p. 164 (1874).

*Danaïs melissa*, Doubleday (nec Cramer), List Lep. Brit. Mus., i., p. 49 (1844); Gen. Diurn. Lep., p. 92, n. 28 (1847).

*Danaïs similis* (part), Horsf. & Moore, Cat. Lep. Ins. Mus. E.I.C., i., p. 122, n. 237 (1857).

*Danaïs similis*, Linn., race *vulgaris*, Butl. Query.

Male and female. Wings above fuscous, with pale bluish markings. Anterior wings above with a long narrow basal streak between costal and subcostal nervures followed by three elongate spots: a large gradually widening streak in cell, deeply notched externally and transversely broken before apex, followed by two elongate spots; two long and linear fasciæ beneath cell, united at base, one running subparallel to submedian nervure, the other directed parallel to median nervure and deflexed before third median nervure; a discal oblique series of five spots, the first and upper one elongate, third smallest, and fourth and fifth largest; a submarginal row of seven spots placed between the nervures, and a marginal row of small spots which tend to become obsolete at apex. Posterior wings with two elongate fasciæ in cell joined together at base, but widely divergent at apex, where there is a linear slightly curved intermediate spot; a long curved linear fascia commencing from beneath base of cell and deflected before third median nervure, followed by a discal series of five linear spots: a submarginal series of about eleven small spots and a marginal series of smaller ones—all these spots and fasciæ pale bluish; two long greyish streaks on each side of internal nervure along abdominal margin. Underside of wings paler; anterior wing with an additional eighth spot to submarginal series, and the cellular streak quite divided before apex; other markings of both wings generally as above. Head and thorax above black, with a linear marginal series of white spots, and a central discal thoracic white streak. Abdomen fuscous above, much paler beneath; sternum black, spotted with white; legs black; fore tibiæ and intermediate and posterior femora streaked with white.

Exp. wings 78 to 85 millim.

HAB.—Continental India; Nepal and Bengal?? (Brit. Mus.).—Tenasserim (coll. Moore).—Malay Peninsula; Province Wellesley (coll. Dist.).—Penang, Malacca, Singapore (Brit. Mus.).—Java.—Borneo (colls. Moore and Brit. Mus.).

Mr. H. G. Smith\* gives this species as an inhabitant of Sumatra, which is doubtless correct; he, however, also adds its pseudo-parent form *D. similis*, from the same locality, which has hitherto only been recorded from China and Formosa.

Although, as previously stated, this is probably but a constant geographical race of *R. similis*, I have treated it here, with this reservation, as a distinct species, and shall follow this *qualified* course where necessary throughout. The question of species and varieties can only be properly estimated by breeding, and it is hoped that some Malay entomologist in whose way this work may fall will add to our knowledge by so doing. At present we can only

\* In Bock, 'Head Hunters of Borneo,' Append. V.



fall back upon the dictum of Mr. C. Darwin, that "in determining whether a form should be ranked as a species or variety, the opinion of naturalists having sound judgment and wide experience seems the only guide to follow. We must, however, in many cases, decide by a majority of naturalists, for few well-marked and well-known varieties can be named which have not been ranked as species by at least some competent judges."\*

### Genus DANAIS.

*Danais*, Latreille, Enc. Méth., ix., p. 10 (1819); Boisd., Lec. Lep. Am. Sept., p. 133 (1833); Doubleday, Gen. Diurn. Lep., p. 89 (1847); Trimen, Rhop. Afr. Austr., p. 84 (1862); Godm. & Salv., Biol. Centr. Am., Rhop., p. 1 (1879).

*Danaida*, Latr., Hist. Nat. Crust. Ins., xiv., p. 108 (1805).

*Danaus*, Latr., Gen. Crust. Ins., iv., p. 201 (1809).

As some modern writers do not use this old and well-known name for the genus, it is perhaps necessary, before giving a diagnosis of the same, to state the reasons why they have discarded it, and why it is still used here. Latreille, finding his earlier name *Danaida* preoccupied in Botany, supplanted it (1809) by the title *Danaus*. Mr. Scudder† argues that as the first name is only used in Botany it ought to be restored. But Mr. Butler‡ has remarked that "*Danaida*" is but the "plural form" of *Danais*, a term first used by Godart§ and systematically more euphonious than *Danaus*, which last is, however, adopted in preference by Mr. Kirby in his supplementary Catalogue (1877). Mr. Crotch|| traces the name to Linnaeus,¶ who used it, however, only as a division of his genus *Papilio*; and therefore Mr. Moore's objection\*\* that *Danaus* was adopted in a generic sense by Esper in 1777 and Panzer in 1801 for species of *Pierinae*, and therefore cannot be retained in this group of butterflies, is an argument that has not, at least hitherto, secured universal acceptance.

Antennæ gradually but distinctly clavate. Wings more or less opaque and thickly covered with scales. Anterior wings subtriangular, somewhat elongate; costal margin slightly arched from base; apex broad and rounded; outer margin oblique and more or less sinuate; inner margin more or less concave. First subcostal nervule emitted at some little distance before the end of cell; second emitted sometimes immediately before the end of cell, but generally not before termination of the same. Posterior wings broad, subtriangular; costal margin nearly straight or slightly curved; apex and anal angle rounded; costal nervule and nervules variable.

Male with one or more specialised scent-glands.

It is difficult to definitely assess the exact number of known species and varieties of this widely represented genus, but probably there are now about eighty distinct forms described. Its distribution is almost universal, and it is found in both the warm-temperate and tropical zones. One, an almost cosmopolitan species, is found in South-Eastern Europe, and others are particularly abundant throughout the Malayan Archipelago, Papua, and the Pacific Region.

\* 'Origin of Species,' 6th ed., p. 37.

† Journ. Linn. Soc., Zool., vol. xiv., p. 291.

‡ Cist. Ent., i., p. 60 (1872).

§ Proc. Am. Acad. Arts & Scienc., p. 153 (1875).

¶ Enc. Méth., ix., p. 172 (1819).

|| Syst. Nat., ed. x. (1758).

\*\* Lep. Ceyl., p. 1, note (1881).

Besides this species, which is found in Europe, and which does not occur much above 41° N., there is also an American species, which extends throughout the length of its tropical regions, and is found as far north as Canada. Mr. Bates\* acutely observes that it is interesting to find that this, the only genus of the *Danaïnae* which is common to the three tropical regions, is the sole one of the subfamily that occurs in high latitudes. And further that "the only means of communication between the intertropical lands of America and Asia seems to have been a circuitous route by the north (or south); and the essentially tropical forms do not appear to have passed along it." This American species, however, has in quite recent times, become (and the process seems still going on) distributed through many of the Pacific Islands, to New Guinea and Australia, and has even been found in Europe, which its previous appearance at the Azores had somewhat rendered probable. A few years ago † I endeavoured to trace the course and cause of this migration, and had reason to come to the conclusion that its distribution was apparently governed by the range of its food-plants, which are species of *Asclepias*, and that the directing causes were probably due to the accidental agency of man in the first place, and possibly also to prevalent winds and currents.

It has been well pointed out by Mr. Wallace that the most widely distributed species are probably the most ancient, and it will particularly apply here, if we qualify that statement by the proposition made by Dr. Buchanan White, ‡ that unless circumstances (not necessarily or always some form of human agency, as Dr. White apparently relies upon) have been exceptionally favourable, species which have the widest distribution are probably of greater antiquity than those whose distribution is less extensive. The most widely distributed species of *Danais* is *D. chrysippus*, the species to which we have alluded as even occurring in S.E. Europe, and which is of a similar tawny hue to the American *D. plexippus*, which has also an exceedingly wide habitat (though probably recent in extent of distribution), and likewise occurs in high latitudes. All the tawny species of the genus with which I am acquainted have, also, but one subcostal nervule emitted distinctly before the end of the discoidal cell; and therefore, if we accept these tawny species as representing the original colour of the genus, we may also accept this as the primitive neururation. This view receives apparent confirmation from observing that it is amongst the green-spotted species that we find the second subcostal nervule emitted before the end of the cell, thus leading on to *Radena*, *Ideopsis*, and *Hestia* in that respect; but which last-named genera take a fresh departure in having the first subcostal nervule anastomosed with the costal nervule. This also appears concurrent testimony to the views of Müller to the same effect, and which we have previously endeavoured to convey (*ante*, p. 3). In a curiously marked East African species in which the tawny and green-spotted facies are combined, and which was lately described by Mr. Godman, § a fresh departure is taken from the ordinary type by the first and second subcostal nervules being anastomosed.

The males possess on the posterior wings one or more dull-coloured patches, situated on or in the neighbourhood of the third median nervule and submedian nervure. These were long known only as "sexual spots," but Müller || has ably and strongly shown that they are really scent-producing organs. They are, indeed, glands or pouches, but as they open only by

\* Trans. Linn. Soc., vol. xxiii., p. 495 *et seq.* (1862).

† Trans. Ent. Soc., 1877, p. 93.

‡ 'Entomologist,' vol. xiv., p. 270 (1881).

§ Proc. Zool. Soc., 1880, p. 183.

|| Trans. Ent. Soc., 1878, p. 213.

a narrow slit, Müller remarks that odours could hardly be freely emitted. He therefore hazards the speculation that the anal tufts of hair might be introduced into the pouches, to be impregnated there with odoriferous matter. A proposition like this, though probable, necessarily requires verification, which an observer of such exactitude and patience as Müller will doubtless endeavour to supply. It is possibly towards such at present unproved postulates that Karl Semper, quoting Jaeger,\* remarks that enough has been done in the way of philosophising by Darwinists, and that the task that now lies before us is to apply the test of exact investigation to the hypotheses we have laid down.

This genus represents, with the other members of the *Danaine*, a "protected" group of insects, which, from distastefulness or other causes, enjoys an immunity from the attacks of birds and other enemies. The testimony to this fact is undoubted and too voluminous to insert here; but even in tenacity of life *Danaïs* is remarkable, and Mr. Trimen† records how South African specimens, caught, *pinched* and pinned by his native collectors, would nearly all, on the withdrawal of the pins, "fly off in a 'nonchalant' manner, as if nothing had befallen them." Mr. Meldola‡ was disposed to consider (and with good reason) that these insects possess an immunity after death from the attacks of mites and other museum pests. He had in his possession a box of old Indian insects, the greater part of which had been demolished by mites; the only surviving specimens, in addition to a *Papilio*, being Danaïds. This view, however, will require further confirmation, as in some East African insects which have lately passed through my hands, specimens of *D. dorippus* have the bodies nearly destroyed by these attacks.

Seven species alone are at present known from the Malayan Peninsula. Crüger,§ in a short notice of Malaccan Lepidoptera, refers to another species, *D. aglea*, but this may prove to rest on a mistaken determination.

A. Anterior wings with the second subcostal nervule emitted a little before the end of discoidal cell.

a. Male possessing two distinct scent-glands on posterior wings.

b. Posterior wings with costal margin slightly curved, and with the first subcostal nervule curved and longer than the second.

### 1. *Danaïs aspasia*, var. *crocea*. (Tab. I., fig. 7.)

*Papilio aspasia*, Fabricius, Mant. Ins., ii., p. 15, n. 145 (1787); Ent. Syst., iii., p. 170, n. 526 (1793).

*Danaïs crocea*, Butl., Proc. Zool. Soc., 1866, p. 57, n. 53, pl. 4, fig. 5; Trans. Linn. Soc., ser. 2, Zool. vol. i., p. 536, 7 (1877).

*Danaïs aspasia*, Butl., Cat. Fabr. Lep., p. 7 (1869).

*Bahora aspasia*, Moore, MS.

Male. Anterior wings above black or fuscous, with the following pale hyaline markings:—three subcostal spots, the inner one situated between first and second subcostal nervules; beneath these are two elongated streaks, followed by four small subapical spots placed in slightly curved oblique series, the upper one very indistinct; two irregularly shaped spots above first median nervule, three between first and second median nervules, three between second and third median nervules, the inner one large and subquadrate; a very large spot (tinged with yellow) occupying basal two-thirds of area between third median nervule and submedian nervure, followed by a small irregular spot; and a marginal series of small

\* 'Animal Life,' (Preface, 1881).

† Ent. Mo. Mag., vol. iv., p. 217.

‡ Proc. Ent. Soc., 1877, p. xii.

§ Verhandl. d. Ver. f. naturwissensch. Unterh. z. Hamb., iii., p. 29 (1878).

spots placed in pairs between the nervules, which become obsolete towards apex. Cell with either the apex only or whole discal centre more or less pale subhyaline. Posterior wings above black or fuscous, with the space between costal nervure and first subcostal nervule; the whole of cell, followed by two elongated spots, situated beneath bases of first and second subcostal nervules, and two near bases of median nervules; basal two-thirds of submedian interspace acutely dentate at apex, and basal two-thirds of internal area pale yellow; a discal row of small pale spots divided by the nervules, and a submarginal series of much smaller, irregularly shaped and arranged spots, both series becoming obsolete towards anal angle. Wings beneath generally as above, but with the spots much more distinct, and with a marginal series to hind wings. Head and thorax above spotted and streaked with white. Abdomen fuscous above, white beneath. Sternum black, spotted with white; legs black; femora streaked with white.

Posterior wings with two distinct spatular scent-glands, largest on third median nervule and smallest on submedian nervure.

Female. Larger than the male, with the apex of the anterior wings much broader, and the cell clearer and paler; marginal spots to hind wings clearly visible above.

Exp. wings, ♂ 70 to 78 millim.; ♀ 86 millim.

HAB.—Continental India; Assam (Warwick, Brit. Mus.).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (colls. Moore and Brit. Mus.); Singapore.—Sumatra.—Java.—Borneo (colls. Moore and Brit. Mus.).

The form designated by Butler as *D. crocea*, which he originally described as distinct, but which he afterwards\* submitted as a *var.* of *D. aspasia*, seems to be a dominant, larger, brighter and somewhat more melanic race of the Fabrician species. A very closely allied species or race, *D. philomela*, Zink., is found in Java.

I have been unable to examine and measure more than one female, a specimen which I captured myself in Province Wellesley.

bb. *Posterior wings with costal margin nearly straight, and with the first subcostal nervule curved and longer than the second.*

## 2. *Danais melaneus*. (Tab. I., fig. 6.)

*Papilio melaneus*, Cramer, Pap. Exot., i., t. 30, fig. D (1775).

*Danais melaneus*, Godart, Enc. Méth., ix., p. 192, 53 (1819); Doubleday, List Lep. Brit. Mus., pl. 1, p. 50 (1844); Doubl. & Hewits., Gen. Diurn. Lep., p. 93, n. 36 (1847); Moore, Cat. Lep. Mus. E. I. C., i., p. 123, n. 242 (1857); Butler, Proc. Zool. Soc., 1866, p. 55, n. 47; Trans. Linn. Soc., ser. 2, Zool. vol. i., p. 536, 6 (1877); Moore, Proc. Zool. Soc., 1878, p. 822.

*Caduga melaneus*, Moore, MS.

Male and female. Wings dark fuscous, with pale bluish semihyaline spots and markings. Anterior wing dark fuscous, with the following pale bluish markings:—three small elongate subcostal spots, the first commencing just beyond first subcostal nervule; beneath these spots are two elongated streaks, followed by a subapical oblique series of three small and rounded spots; nine irregularly sized and shaped spots on disk, situated two above and three beneath first median nervule, three between second and third median nervules, and one near posterior angle a little beyond a large streak (generally but not always longitudinally divided) which occupies about basal two-thirds of interspace between third median nervule and submedian nervure, and a submarginal series of small spots which become obsolete and obliterated towards apex; discoidal cell with a large discal streak (this is very irregular in size in different specimens).

\* Cat. Fabr. Lep., p. 7 (1869).

Posterior wings dark fuscous, with the following pale bluish markings:—a large basal subcostal streak, followed by a small elongate spot; the interior of discoidal cell followed and apically surrounded by five elongate spots situated between the nervules, of which the two interior are each followed by a smaller and rounded spot; four long, basal, longitudinal streaks, two situated before median nervure and connected at base, and two on abdominal margin; two or three subdiscal spots, situated between the nervures near apex, and a submarginal series of small spots, which are obsolete and obliterated near apex and anal angle. Wings beneath generally as above, but with the submarginal spots continuous and distinct, and the subdiscal series of three spots, as seen above, continued in regular but smaller series to near anal angle. Head and thorax above dark fuscous, spotted and streaked with bluish white; abdomen fuscous above, testaceous beneath; sternum black, spotted with white; undersides of palpi, femora, and trochanters white.

Male with two linear scent-glands on posterior wings, the longest situated on submedian nervure near apex, the smaller one near apex of internal nervure.

Exp. wings 79 to 92 millim.

HAB.—Burma; Moulmein (coll. Moore).—Upper Tenasserim (coll. Wood-Mason).—Malay Peninsula; Province Wellesley (coll. Dist.); Penang; Malacca (Brit. Mus.); Singapore (coll. Hewits.).—Java (coll. Dist.).—Sumatra.\*—Formosa (Brit. Mus.).

This species varies much in amount of melanism, and also in the size of the pale markings; some males have also the apex of the anterior wings more produced than in other specimens of the same sex, thus further illustrating the little specific value of such characters. About six species with similar structural characters and common facies are allied to this species, as pointed out to me by my friend Mr. Moore, who has specially studied the *Danaïne*. These form a group which are represented in Continental India, Java, Phillipine Islands, and Japan.

### 3. *Danaïs agleoides*. (Tab. I., fig. 5.)

*Danaïs agleoides*, Felder, Wien. Ent. Mon., iv., p. 398, n. 17 (1860); Moore, Proc. Zool. Soc., 1877, p. 581; Wood-Mason & Nicéville, J. As. Soc. Beng., vol. i., p. 224 (1881).

*Danaïs grammica*, Butl., Proc. Zool. Soc., 1866, p. 55, n. 44; Trans. Linn. Soc., ser. 2, Zool. vol. i., p. 536, n. 5 (1877), nec. Boisd.

*Parantica agleoides*, Moore, MS.

Male and female. Wings dark fuscous, with pale bluish semihyaline spots and markings. Anterior wings above dark fuscous, with the following pale bluish markings:—a basal longitudinal streak, situated between costal and subcostal nervures, followed by three subcostal spots, the first situated immediately after first subcostal nervule, beneath which are two short linear streaks, divided by upper discoidal nervule; nine irregularly shaped discal spots situated two above and three beneath first median nervule, three beneath second median nervule, and one near posterior angle a little beyond two narrow fasciæ, joined at base, the first running parallel to median nervure, and then deflexed subparallel to third median nervule, the other running subparallel to submedian nervure; a narrow fascia commencing at base and extending along about half the length of submedian nervure; two long discal streaks in discoidal cell, the upper one straight and divided, the lower more or less recurved; a submarginal row of seven irregular spots, and a marginal row of very small spots placed in pairs between the nervules, becoming obsolete and obliterated towards apex. Posterior wings above dark fuscous, with the following pale bluish markings:—a long basal streak between costal and subcostal nervures, followed by a small elongate spot; two fasciæ in cell, united at base, and from thence running subparallel to subcostal and median nervures, between apex of each is a short intermediate streak; following and surrounding apex of cell are five irregular

\* Smith, in Bock, 'Head Hunters Borneo,' Append. V.

and elongate spots, the first situated above second subcostal nervule, the others between the nervules, the last two of which are followed by two irregularly shaped spots; two long narrow fasciæ, united at base, the upper of which runs parallel to median nervure, and is then deflexed along inner side of third median nervule, the lower parallel to submedian nervure; two long fasciæ on abdominal margin, divided by internal nervure; a waved submarginal row of small spots (obsolete near base in male and continuous in female), and a marginal row of small spots, inconstant in size and distinctness. Underside of wings somewhat paler; marginal rows of spots to both wings, and submarginal row to posterior wings, continuous and distinct. Posterior wings with two basal spots before precostal nervure, and a curved basal fascia above costal nervure, which is hidden above by the inner margin of anterior wing. Head and thorax above spotted and streaked with white; abdomen fuscous above, white beneath; sternum black, spotted with white; undersides of palpi, trochanters and femora white.

The posterior wing of the male is provided with two spatular scent-glands, the largest situated on third median nervule, and the smallest on submedian nervure.

Exp. wings, 69 to 76 millim.

HAB.—Nicobar Islands (Calcutta Mus.).—Burma; Moulmein (Brit. Mus.).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (coll. Brit. Mus.).—Sumatra. (Smith.)

A female form is here figured. By a curious accident the specimens of this species in the Collection of the British Museum have hitherto stood in the name of *D. grammica*, and probably this error may have had somewhat wide circulation, by collectors having accepted the Museum name without the necessary certification by reference to Boisduval's figure.

B. *Anterior wings with the second subcostal nervule not emitted distinctly before the end of discoidal cell.*

c. *Male provided with one scent-gland on posterior wings.*

d. *Posterior wings with costal margin slightly curved, and with the first subcostal nervule not longer than the second.*

#### 4. *Danais septentrionis*. (Tab. I., fig. 9.)

*Danais septentrionis*, Butler, Ent. Mo. Mag., vol. xi., p. 163 (1874; Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 536, 4 (1877); Moore, Proc. Zool. Soc., 1878, p. 822; Semper, Journ. Mus. Godeffr., vol. xiv., p. 140, tab. 8, fig. 7 (1879).

*Tirumata septentrionis*, Moore, Lep. Ceylon, vol. i., p. 5, pl. 1, fig. 2 (1881).

Male and female. Wings above dark glossy fuscous, with pale bluish spots and markings. Anterior wings above dark glossy fuscous, with the following pale bluish markings:—a longitudinal basal streak in cell, followed near its apex by a transverse irregular and much sinuated fascia; beyond cell are three elongate and linear subcostal spots, the inner two placed close together near end of cell; beneath these are three linear streaks, the first and smallest situated above and the second and largest beneath the first discoidal nervule; thirteen irregular spots on discal surface, upper three divided between discoidal nervules, and the remainder thus situated—four between first and second median nervules, three between second and third median nervules, and three between third median nervule and submedian nervure, which nervure is also preceded by a subparallel linear basal streak; and a marginal series of small spots irregularly sized and placed. Posterior wings above dark glossy fuscous, with the following pale bluish markings:—two long fasciæ in cell, broadly united at base, and widely divergent at apex; the cell is followed and surrounded by the following streaks or fasciæ:—a narrow linear and outwardly thickened one above subcostal nervule, three which are much broader divided by lower subcostal and discoidal nervules, two which are very narrow,

linear, and dentate separated by second median nervule, and two united at base between median and submedian nervures; two long linear streaks on abdominal margin divided by internal nervure, and a narrow linear streak on inner side and about centre of submedian nervure; a discal and much waved series of fourteen irregularly sized spots (in some specimens the inner two are united to the two abdominal-marginal streaks), and a much waved marginal series of smaller spots. Underside of wings much paler, markings as above, and two spots at base of posterior wings divided by precostal nervure. Head and thorax above dark fuscous, spotted and streaked with white; abdomen above brown, ochraceous beneath; sternum black, spotted with white; legs black; under surfaces of palpi, trochanters and femora white.

Male with a large and distinct scent-gland situated between third median nervule and median nervure.

Exp. wings 82 to 108 millim.

HAB.—Continental India; Cachar; Nepaul (Brit. Mus.).—Ceylon (colls. Moore and Dist.).—Tenasserim (Limborg.)—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.).—Java (coll. Moore).

Males from the Malay Peninsula exhibit probably the maximum of size, and are in strong contrast, in that respect, to some Ceylon specimens. Mr. Butler appends to his description the very applicable remark that “there can be no doubt that this is the Indian representative of the Australian species *D. hamata*, M’Leay.” All the differential characters relied upon by Butler are found in Malayan specimens, but certainly do not apply so strongly to all the Ceylon forms, some of which in size and markings approximate much more closely to the Australian species.

G. Semper, in a valuable paper, “Beitrag zur Rhopaloceren-Fauna von Australien,”\* has urged that *D. septentrionis* and some other described forms are probably “local forms” of *D. hamata*, which really agrees with Butler’s views, already quoted, that the first-named may be considered the “Indian representative” of the Australian species. It is necessary that these qualitative views and potentialities should be clearly understood, as they afford pregnant illustration to the conclusions of Gabriel Koch.† This author, from an examination of the species found in the South Asiatic and Australian Regions, concludes that in many cases the differences between what are generally considered as distinct species are merely variations consequent upon a change of habitat. (It is doubtless implied that the surrounding conditions are also different.) This, however, with the manifold readings of the much-vexed term “species,” is unimportant. He, however, considered that these facts warranted a belief in an Indian or South Asiatic fauna, which included the warmer parts of Asia, Malasia, Polynesia, and Australia, and Prittwitz,‡ in a notice of Koch’s results, supplemented by his own examination of Vollenhoven’s *Pieride* derived from the Dutch East Indian Possessions, agrees with Koch in formulating the existence of an Indo-Australian Region. Koch, however, in 1870,§ modified his views, dividing this proposed fauna into two parts,—a South Asiatic or Indian and an Australian and Polynesian fauna, which last he considers, without doubt, has been derived from the Indian by migration, the principal agents of which are the prevalent monsoons. He then, however, seems to infer that the greatest modifying agent in the formation of new species is the influence of climate. Oscar Schmidt,|| after a study of Koch’s labours,

\* Journ. Mus. Godeffr., vol. xiv., p. 138.

† ‘Die Indo-Australische Lepidopteren-Fauna’ (1866).

‡ Stett. Ent. Zeit., 1866, p. 259.

§ ‘Die geographische Verbreitung der Schmetterlinge über die Erde,’ Geogr. Mitth. (1870).

|| ‘The Doctrine of Descent,’ p. 227.

summarises his agreement in the statement that butterflies "which are an easy prey to currents of air, defy geological barriers, and, above all, that important partition which from the tertiary era has been erected, or rather excavated, in the bottom of the sea, between Australia and India."

### 5. *Danais genutia*. (Tab. 2, figs. 2, 3.)

*Papilio genutia*, Cramer, Pap. Ex., iii., t. 206, C, D (1782).

*Papilio plexippus*, Fabr., Syst. Ent., p. 481, n. 170 (1775); Mant. Ins., p. 27, n. 281 (1787), nec. Linn.

*Danais plexippus*, Godt., Enc. Méth., ix., p. 186, n. 35 (1819); Butler, Cat. Fabr. Lepid., p. 6, n. 10 (1869); Trans. Linn. Soc., 2 ser., Zool., vol. i., p. 536, n. 1 (1877); Wood-Mason & Nicéville, Journ. A. S. Bengl., vol. L., p. 226 (1881).

*Salatura genutia*, Moore, Lep. Ceylon, i., p. 6, pl. iv., figs. 2, 2a (1881).

Male and female. Wings above fulvous-red; neuration, apex of anterior and margins of both wings dark fuscous, spotted and marked with white. Anterior wings fulvous-red; costal margin, apical third, outer and inner margin, nervures and nervules dark fuscous; the fuscous portion contains the following white markings:—a small subcostal spot before end of cell, three somewhat larger spots just beyond end of cell, and a transverse subapical series of six large spots, the upper two smallest and divided by second subcostal nervule, fourth and fifth largest divided by second discoidal nervule, sixth much smaller and rounded, on the outer side of which is a smaller spot followed below by two still smaller ones; and a marginal series of small spots, becoming indistinct and obliterated towards apex. Posterior wing fulvous-red; nervures, nervules, and outer margin dark fuscous, the median nervules very broadly so; a submarginal and marginal series of small white spots, and abdominal margin much paler. Anterior wings beneath generally as above, but with a distinct white spot on inner side of fuscous margin between second and third median nervules; a distinct and continuous marginal and submarginal series of spots, and with the dark shading paler and brownish, beyond the large transverse subapical spots. Posterior wings very much paler than above; the nervures and nervules margined with very pale greenish, and with a distinct costal spot near apices of costal nervure and first subcostal nervule. Head and thorax above dark fuscous, spotted and streaked with white; abdomen fulvous-red above, a little paler beneath; sternum black, spotted with white; legs black; under surfaces of palpi, trochanters, and femora white.

(A variety in which the posterior wings have the fulvous-red much suffused with white is not infrequent, and is represented by fig. 3).

Male with a broad subovate scent-gland situated on posterior wing adjoining third median nervule.

Exp. wings 73 to 90 millim.

HAB.—Continental India; Bengal; Cachar (Brit. Mus.).—Nicobar Islands.—Ceylon (coll. Moore).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (colls. Moore and Brit. Mus.); Singapore (coll. Moore).—Java.—Siam.—N. China; Hong Kong; Hainan.—Formosa (colls. Moore, Dist., and Brit. Mus.).

This species has until quite recently been recognised by the name of *D. plexippus*, Linn. It has, however, been shown by Hermann Strecker,\* and also by Godman and Salvin,† that the name and description given by Linnæus really applied to a well-known and widely distributed species, which for a long time had passed under the designation of *D. archippus*. As it is impossible for two species in one genus to be known under the same name, that of Cramer must henceforth be applied to this insect. The only Javan specimen in my collection

\* Butt. N. America, p. 105.

† Biol. Centr. Am. Rhop., p. 2.



is the smallest of the series, and the darkest in coloration. Capt. de la Chaumette\* states that in India the insect is common throughout the year, frequenting fields, gardens, and woods alike. Mr. Biggs† speaks of it as circling in the sunshine "round a lantana bush" or resting in damp shady spots on the pale blue flowers of a small plant which the Malays call "bulalei gajah" (Elephant's trunk).

#### 6. *Danais melanippus*, var. *hegesippus*. (Tab. II., fig. 1.)

*Papilio melanippus*, Cramer, Pap. Exot., ii., t. 127, A, B (1779).

*Danais melanippus*, Godt., Enc. Méth., ix., p. 189, n. 43 (1819); Horsf. & Moore, Cat. Lep. Mus. E. I. C., i., p. 125, n. 247 (1857); Butl., Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 536, n. 2 (1877).

Var. *Papilio hegesippus*, Cram., Pap. Exot., ii., t. 180, A (1779); Fabr. Sp. Ins., p. 56, n. 248 (1781); Mant. Ins., p. 27, n. 287 (1787); Ent. Syst., iii., p. 52, n. 160 (1793); Horsf. & Moore, Cat. Lep. Ins. Mus. E. I. C., p. 125 (1857); Butler, Proc. Zool. Soc., 1866, p. 49.

*Danais hegesippus*, Godt., Enc. Méth., ix., p. 189, n. 42 (1819); Gray, Lep. Ins. Nepaul, p. 10, t. 9, f. 1 (1846); Snellen, Tijd. Ent., xx., p. 66 (1877).

*Danais melanippus*, var. *hegesippus*, Snellen, Tijd. Ent., xix., p. 144 (1876).

*Salatura hegesippus*, Moore, MS.

Male and female. Anterior wing fulvous-red, nearly apical half, the costal margin, inner margin, nervures and nervules dark fuscous. Fuscous portion with the following white spots:—two small subcostal spots divided by first subcostal nervule, almost beneath which are two others, more rounded and placed just beyond cell; a transverse subapical row of five larger spots, upper two smallest and divided by second subcostal nervule, fourth and fifth largest divided by lower discoidal nervule; a discal row of two small spots divided by second median nervule; a submarginal series of three or four spots about centre, and a marginal series which become almost effaced between third median nervule and submedian nervule, and also towards apex, where, however, they are denoted by a much larger spot preceded by one or two smaller ones. Posterior wing white; nervures and nervules broadly infuscated and with fuscous marginal border, in which are placed a marginal and submarginal series of small white spots. Underside of wings as above, but anterior wings possessing a distinct marginal and submarginal series of small spots at apex; posterior wing with the nervures and nervules much less strongly infuscated, but margined with very pale greenish. Head and thorax above dark fuscous, spotted and streaked with white. Abdomen above dull ochraceous, with the base black; underside pale ochraceous. Sternum black, spotted with white; legs black. Under surfaces of palpi, femora, and trochanters white.

Male with a distinct subovate scent-gland on posterior wings, placed on inner side and adjoining third median nervule.

Exp. wings 70 to 85 millim.

HAB.—Andaman Islands (coll. Moore).—Burma; Moulmein (colls. Moore and Brit. Mus.).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (colls. Moore and Brit. Mus.).—Sumatra (Snellen, coll. Moore).—Java (Snellen and Brit. Mus.).

In considering this form as only a variety of *D. melanippus*, I am in agreement with Messrs. Moore, Butler, and Snellen, who have at least at one time published that view (see *supra*). The chief difference between the two forms is that the ground colour of the posterior wings in *D. melanippus* is fulvous-red, whilst in *D. hegesippus* it is white, and the four small spots near the end of cell of anterior wing of the last named are considerably effaced in *D. melanippus*.

\* Ent. Mo. Mag., vol. ii., p. 37.

† Month. Pack., vol. ii., p. 188 (1881).

However, we have already seen in the closely allied *D. genutia* that such variation does take place, and the only peculiarity in this case seems to be that the white variety has become the dominant race in the Malay Peninsula, whilst the form *D. melanippus* is, as far as I am aware, absent. Such being the case, it is necessary to notice that Mr. Butler, in his paper on the "Butterflies of Malacca,"\* in enumerating *D. melanippus*, Cram., as belonging to that district, has by an oversight referred also to the illustration of Cramer, which depicts the typical coloration, not found in Malacca, as the specimens in the British Museum testify.

### 7. *Danais chrysippus*. (Tab. I., fig. 10.)

*Papilio chrysippus*, Linnæus, Mus. Ulr., p. 263 (1764); Syst. Nat., i., 2, p. 767, n. 119 (1767); Fabr. Syst. Ent., i., p. 482, n. 172 (1775); Sp. Ins., p. 56, n. 245 (1781); Mant. Ins., p. 27, n. 284 (1787); Ent. Syst., iii., p. 50, n. 154 (1793); Cramer, Pap. Ex., ii., t. 118, B, C (1779); Herbst, Naturs. bek. Ins. Schmett., vii., pl. 155, figs. 1 & 2.

*Euploea chrysippus*, Hübn., Verz. bek. Schmett., p. 15, t. 133, figs. 678 & 679 (1816).

*Danais chrysippus*, Godt., Enc. Méth., ix., p. 187, n. 38 (1819); Horsf. & Moore, Cat. Lep. Ins. Mus. E. I. C., i., p. 126, n. 249 (1857); Trimen, Rhop. Afr. Austr., p. 88, n. 56 (1862); Butler, Proc. Zool. Soc., 1866, p. 46, n. 14.

*Salatura chrysippus*, Moore, Lep. Ceylon, p. 7 (1881).

Male and female. Anterior wing above fulvous-red, with the costal margin, apical third, and outer margin dark fuscous. On the fuscous portion are the following white markings:—a small subquadrate spot beneath costa before end of cell; an elongate subcostal spot near end of cell, beyond which is a much angulated and oblique fascia, composed of transverse spots, commencing beneath first subcostal nervule and terminating at first median nervule; at end of cell are two (sometimes but one) small spots, and a larger one on disk between first and second median nervules; a submarginal series of spots consisting of two between first and second median nervules, and one near apex (in some specimens these are connected by a series of very small spots); and a marginal series of spots, generally absent, but sometimes obsoletely present near apex. Posterior wing fulvous-red, with a fuscous marginal border, containing a marginal series of white spots; a fuscous spot margined with white on costal margin, above first subcostal nervule, and a small spot above costal nervule; three irregular fuscous spots (the middle one smallest) at end of cell, situated at bases of second subcostal, discoidal, and first median nervules. Underside of anterior wings as above, but beyond the subapical fascia to near margin the fuscous is replaced with ochraceous, and between second and third median nervules a small white spot is visible; underside of posterior wings much paler than above; marginal white spots larger, and two fuscous costal spots visible above first subcostal nervule. Head and thorax above black, spotted and streaked with white; abdomen above fulvous-red, beneath much paler; sternum black, spotted with white; legs black; under surfaces of palpi, trochanters, and femora white.

Male with a large fuscous-coloured scent-gland on posterior wing, on inner side of third median nervule.

Exp. wings 58 to 86 millim.

HAB.—S.E. Europe.—Western and Southern Africa.—Madagascar.—Rodriquez.—Island Johanna.—Mauritius.—Socotra.—Turkey in Asia.—Afghanistan; Candahar.—Continental India.—Ceylon.—Burma. Upper Tenasserim (colls. God. & Salv., Moore, and Brit. Mus.).—Malay Peninsula; Penang; Province Wellesley; Singapore (coll. Dist.).—Java.—Malay Archipelago; Lomboek; Kaióia Islands (coll. Dist.).—Siam (coll. Godm. & Salv.).—China; Hong Kong; Hainan (colls. Moore and Brit. Mus.).

\* Trans. Linn. Soc. Lond., 2 ser., Zool., vol. i., p. 536 (1877).

A female specimen from Province Wellesley is here figured. The smallest specimen which I possess (58 millim.) is from West Africa, although ordinarily sized specimens are generally received from that district; the largest specimens in my collection are from Northern India and Southern Africa, though no rule can be postulated in this respect. Figures of both the larva and pupa of this insect have been given (*ante* pp. 2 & 3).

The larva in Ceylon feeds on *Calotropis gigantea* and *Asclepias curasavica*;\* in Java, according to Dr. Horsfield, on the first named, called by the natives "Widuri"; in Continental India on *Calotropis* sp.;† and in S. Africa on *Gomphocarpus fruticosus* and *Asclepias* sp.‡

This species is not only remarkable for its wide distribution, but also for the extraordinary phenomenon of its being *mimicked* by six or eight other butterflies and moths, a fact which will be treated more fully subsequently when describing some of the mimicking species.

### Genus EUPLŒA.

*Euplœa*, Fabricius, Illiger's Mag., vi., p. 280 (1808); Doubl., Gen. Diurn. Lep., p. 86 (1847); Trimen, Rhop. Afr. Austr., p. 83 (1862).

Antennæ gradually clavate. Wings opaque and dark coloured. Anterior wings more or less triangular and varying much in shape, but in the male sex generally having the inner margin more or less produced and convex, and covering some basal portion of the posterior wings; in the female sex the inner margin is non-produced and sometimes slightly emarginate.§ First subcostal nervule emitted at some little distance before the end of the cell, second emitted at end of cell; upper disco-cellular nervule shortest. Posterior wings broad and subtriangular; costal nervure somewhat short, and curved near base.

Males usually provided with one or more pseudo-scent glands or brands on anterior wings, and very frequently with a pale discoidal patch to posterior wings.

Awaiting Mr. Moore's intended enumeration and revision of the genus *Euplœa* (as formerly and in this work understood), wherein many new species are to be described, it would prove misleading to give any approximate estimate as to the number of species comprised in this very extensive genus.

*Euplœa* is widely distributed throughout the Malayan Archipelago and Polynesia; in fact, we may accept these regions as the head-quarters of the genus. It is likewise found throughout the warmer parts of Asia (including its neighbouring islands) and Australia; it also inhabits the islands of Mauritius, Bourbon, and Madagascar. Trimen|| gives South Africa as the habitat of a species (*E. goudotii*, Boisd.), from specimens contained in the British Museum. As, however, Butler, in his two subsequent papers on the genus,¶ does not give that habitat for the Museum specimens, South Africa may be considered for the present as a doubtful locality.

The short vittæ so frequently found on the anterior wings of the males, have been,

\* Moore, Lep. Ceylon, p. 7. † Lang., Ent. Mo. Mag., i., p. 131; and De la Chaumette. *ibid.* ii., p. 37.

‡ Trimen, Rhop. Afr. Austr., p. 90.

§ This sexual difference in the shape of the anterior wings is found in all the species here described.

|| Rhop. Afr. Austr., p. 84 (1862).

¶ Proc. Zool. Soc., 1866, p. 301, and Journ. Linn. Soc., Zool., vol. xiv., p. 298.

judging from analogy, considered as scent-producing organs, and I have alluded to them here as pseudo scent-glands or brands. On the other hand, they may serve for purposes of "strigillation," as proposed by Butler,\* being impressed upon that portion of the anterior wings which comes in contact with the anterior margin and prominent costal nervure of the posterior wings.

Like other genera of the *Danaine*, and especially *Danais*, this genus enjoys an immunity from the ordinary enemies of butterflies, and hence may be described as possessing a strongly "protective" character. In tropical America, the widely distributed and extensive genus *Heliconius* was first shown to enjoy this protection or immunity by Bates,† a fact subsequently and amply confirmed by Belt.‡ Wallace, who enjoyed the unusual opportunity of observing both these genera in a state of nature and in their widely separated habitats, writing from Singapore, states, "The *Eupleas* here quite take the place of the *Heliconidae* of the Amazons, and exactly resemble them in their habits."§

I at present only include seventeen species of *Eupleea* as found in the Malay Peninsula, though it is probable that more remain to be discovered, particularly in the Northern and Eastern districts.|| These species (in whatever way we may define that term) are also of very unequal value. What appears to be three distinct and constant local forms of one species frequently occur, of which we have three instances in this fauna. Thus *E. malayica* and *E. midamus* have distinct and constant representatives both in Java and Borneo (of the last named, the Bornean representative is reported as having been received from Malacca), and *E. diocletianus* possesses distinct and representative forms both in North India and Borneo.

A. Males neither provided with a pseudo scent-gland or brand to anterior wings, nor with pale discoidal patch to posterior wings.

a. Males with the inner margin of the anterior wings much produced and convex.

### 1. *Eupleea malayica*. (Tab. II., fig. 7.)

*Crastia malayica*, Butler, Journ. Linn. Soc., vol. xiv., p. 297, 3 (1878).

*Eupleea ochsenheimeri*, var. (b), Butl., Proc. Zool. Soc., 1866, p. 271.

*Eupleea ochsenheimeri*, Butl., Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 535, n. 2 (1877).

*Adijama malayica*, Moore, MS.

Male. Wings above dark shining brown, spotted with white. Anterior wings with the following white spots:—one before and one after second subcostal nervule; one in cell a little before lower disco-cellular nervule; a waved discal series of six spots placed between the nervules, the upper three of which are largest, and the upper one placed above first disco-cellular nervule, the last and most linear one being below third median nervule; a submarginal series of eight spots, the upper and innermost one of the series being situated between third and fourth subcostal nervules, the lower one placed between third median nervule; and a marginal series of smaller spots. Posterior wings with a marginal and submarginal series of small white spots. Wings beneath marked as above, but posterior wings possessing in addition seven small white discal

\* Journ. Linn. Soc., Zool., vol. xiv., p. 292.

† Trans. Linn. Soc., vol. xxiii., 1862, p. 495 *et seq.*

‡ Proc. Ent. Soc., 1866, p. xlv., and 'Naturalist in Nicaragua,' p. 316.

§ 'Zoologist,' p. 4396 (1854).

|| Butler (Journ. Linn. Soc., Zool., vol. xiv., p. 295, 41) gives another species, *E. agyptus*, as having been received from Singapore. That Singapore specimen, however, no longer remains in the National Collection under that name, and was probably so recorded in error.

spots, one in and near end of cell, and six surrounding apical portion of cell and placed between the nervules. Head and thorax above black; head and anterior portion of thorax spotted with white. Abdomen above dark fuscous, spotted with pale bluish beneath. Head beneath, sternum and legs black; palpi, sternum and extreme base of wings spotted with white.

Female. I have not seen this sex, but Butler describes it as having on the posterior wings "a spot in the cell, followed by three complete series." This probably could be somewhat expressed by saying, posterior wing of the female above marked as underside of the same wing in male.

Exp. wings, ♂ 110 to 115 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca; Singapore (Brit. Mus.).—Sumatra (coll. Moore).

This is but a constant local race of *E. oxsenheimeri*, Moore, a species which Butler considers is probably the *E. gyllenhalii*, Lucas,\* and is apparently confined to Java. The Bornean form has also been separated, under the name of *E. scudderi*.

*E. malayica* is in itself variable, as in a second male specimen which I possess the spots on the upper surface are much smaller, and the submarginal spots to the posterior wings are very faint and obscure towards the anal angle.

## 2. *Euplœa bremeri*. (Tab. II., fig. 4.)

*Euplœa Bremeri*, Felder, Wien. Ent. Mon., iv., p. 398, n. 16 (1860); Butl., Proc. Zool. Soc., 1866, p. 277, 28; Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 535, n. 6 (1877).

*Crastia Bremeri*, Butl., Journ. Linn. Soc., vol. xiv., Zool., p. 298, n. 9 (1878).

*Tronqa Bremeri*, Moore, MS.

Male. Wings above dark olivaceous-brown, becoming somewhat darker towards base. Anterior wings with the following white spots:—one near costa between first and second subcostal nervules, one beneath end of cell, between first and second median nervules (in some specimens there is an additional spot in and before end of cell and another between second and third median nervules); a submarginal series of eight spots, the upper three divided by third and fourth subcostal nervules, fourth and fifth much the largest, eighth placed between second and third median nervules; and a marginal row of small spots. Posterior wings with a marginal and submarginal row of small white spots. Wings beneath pale olivaceous-brown; anterior wings spotted as above, but with four additional discal spots, one in and near end of cell, one beyond end of cell, and one on each side of third median nervule; posterior wings spotted as above, but also with six or seven discal spots, one in and near end of cell, and six (in some specimens five) surrounding apical portion of cell, placed between the nervules. Head and thorax above black; head and anterior portion of thorax spotted with white. Abdomen dark fuscous, spotted with bluish beneath. Head beneath, sternum and legs black; palpi, sternum and extreme base of wings spotted with white.

Exp. wings 90 millim.

HAB.—Continental India; Assam (Warwick, Brit. Mus.); Burma (coll. Moore).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.).

I have not as yet received the female of this species, nor did I capture one myself in Province Wellesley. As will be seen by the above description, which agrees with Felder's original diagnosis, the discal spots on the anterior wings are variable in number.

\* Journ. Linn. Soc., vol. xiv., p. 297 (1878).

B. Males not provided with a pseudo scent-gland or brand to anterior wings, but possessing a pale discoidal patch on posterior wings.

b. Males with the inner margin of the anterior wings much produced and convex.

### 3. *Euplœa castelnaui*. (Tab. II., fig. 6.)

*Euplœa castelnaui*, Felder, Reise Nov. Lep., ii., p. 315, n. 427 (1865).

*Euplœa phœbus*, Butler, Proc. Zool. Soc., 1866, p. 270, n. 3; Druce, Proc. Zool. Soc., 1874, p. 103, 1; Butl., Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 535, 1 (1877).

*Salpinx (Macroploea) phœbus*, Butl., Journ. Linn. Soc., vol. xiv., p. 292, 3 (1878).

Male. Anterior wings olivaceous-brown, becoming gradually paler towards apex, and with the following pale spots:—one in cell, a little before lower disco-cellular nervule, two near costa, divided by second subcostal nervule, followed by a curved discal series of six spots placed between the nervules, a submarginal series of eight spots, of which the upper and innermost one is placed between the third and fourth subcostal nervules, and a marginal series of smaller and more linear spots. Posterior wings dark olivaceous-brown, with a large pale discoidal patch situated near costal margin, and indications of two submarginal and a marginal series of pale spots, which are somewhat distinct near apex, but become obsolete towards anal angle. Underside of wings generally as above, but anterior wings with the discal series of spots larger posteriorly, the marginal series to posterior wings more continuous and distinct towards anal angle, and the posterior margins of anterior wings much paler, especially towards anal angle. Head, thorax and abdomen blackish; head and anterior portion of thorax spotted with white; underside of head, sternum and legs black; palpi and sternum spotted with white.

Female. Somewhat larger and paler, with the discal series of spots to the anterior wings more obscure, and of the submarginal series those near apex have large pale inner reflections. Posterior wings with a distinct marginal and submarginal series of spots, the last preceded by an inner and more obscure series.

Exp. wings, ♂ 120 millim.; ♀ 125 millim.

HAB.—Burma: Moulmein.—Malay Peninsula; Province Wellesley (coll. Dist.); Penang (coll. Dist. and Brit. Mus.); Malacca (Brit. Mus.).—Siam (coll. Godm. & Salv.).—Java (coll. Dist. and Brit. Mus.).

A female specimen is here figured.

As Mr. Butler has himself admitted the identity of his *E. phœbus* and *E. castelnaui*, Felder,\* of which there can be no doubt, it becomes necessary to use the earlier and Felderian name to this insect, though Butler still retains his own designation.† Some uncertainty appears to have arisen as to the exact date of Felder's descriptions of species of *Euplœa*, Kirby giving 1867‡ as the year of publication. Felder's plates bear date 1865, though the text is stated to have been published from 1864 to 1867, and as Butler himself§ gives 1865 as the date of a subsequent description by Felder, it is difficult to see why the apparent law of priority cannot in this case be followed.

bb. Males with the inner margins of anterior wings slightly produced and convex.

### 4. *Euplœa midamus*. (Tab. II., figs. 8 ♂ & 9 ♀.)

*Papilio midamus*, Linnaeus, Mus. Ulr., p. 251 (1764); Syst. Nat., ii., p. 765, n. 108 (1767).

*Danaïs midamus*, Godt., Enc. Méth., ix., p. 179, n. 12 (1819).

*Euplœa midamus* (part), Butl., Proc. Zool. Soc., 1866, p. 294, n. 76.

\* Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 535, 1 (1877).

† This author has (Trans. Ent. Soc., ser. 3, vol. v., p. 471) argued that Felder's work was antedated.

‡ Syn. Cat. Diurn. Lep.

§ Trans. Linn. Soc., ser. 2, Zool., p. 535, 3 (1877).

*Euplea midamus*, Butl., Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 535, n. 9 (1877).

*Trepichrois midamus*, Butl., Journ. Linn. Soc., Zool., vol. xiv., p. 297, 3 (1878); Moore, Proc. Zool. Soc., 1878, p. 823.

Male. Anterior wings above dark violet-blue, with bright blue reflections towards apex, and with the following pale spots:—a small one between first and second subcostal nervules (this is sometimes absent); one in cell before lower disco-cellular nervule, two beneath cell situate on each side of second median nervule, three beyond cell divided by discoidal nervules, a submarginal series of about seven irregularly shaped spots, and a marginal series of very small spots which become obsolete towards apex. Posterior wings dark brown, with the costal and apical third pale brown and subgranulose, and with a small pale patch in cell. Underside of wings pale brown; anterior wings spotted generally as above, but with the apical marginal spots more distinct and continuous; posterior wings with five small white discal spots, one in and near end of cell, and four surrounding apical portion of cell, situated between the nervules; a marginal series of small spots of the same colour, and a submarginal series which only extends about half-way from apex (in one specimen from Province Wellesley this series is continuous) to anal angle. Head and upper part of thorax black; head and anterior portion of thorax spotted with white; abdomen dark fuscous, spotted and marked with pale bluish beneath. Head beneath, sternum and legs black; palpi, sternum and extreme base of wings spotted with white.

Female. Anterior wings pale brown, with a paler longitudinal streak in cell, a similar one between third median nervule and submedian nervure, a large ill-defined but bright blue patch on apical third of wing, and spotted with white as in male. Posterior wings pale brown, with a long white streak on each side of cell, and an intervening and shorter one of the same colour at its apex; three narrow white streaks following cell, divided by the lower subcostal and discoidal nervules; a submarginal series of narrow elongate spots, which at basal half of wing are continued upwards and united in pairs near median nervure; two narrow longitudinal streaks on abdominal margin, the outer one of which is broadly bifurcate posteriorly, and a marginal series of smaller white spots. Underside of wings pale brown, marked and spotted with white as above; on the anterior wings, however, the two pale longitudinal streaks above are distinct and white beneath.

Exp. wings, ♂ 90 to 96 millim.; ♀ 96 millim.

HAB.—Continental India; Khasia Hills: Nepaul; Silhet.—Burma: Moulmein.—Upper Tenasserim (coll. Moore).—Malay Peninsula; Penang; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.).—Siam (coll. Godm. & Salv.).—Sumatra (Brit. Mus.).

This widely-spread, abundant, and protected species is mimicked by several other butterflies belonging to different and non-protected families. In particular it is mimicked by *Papilio paradoxa* and *P. enigma*, and Mr. Wallace\* states that he often captured those species under the impression that they were simply the more common *E. midamus*.

##### 5. *Euplœa mulciber*. (Tab. III., fig. 1 ♂, 2 ♀.)

*Papilio mulciber*, Cramer, Pap. Exot., ii., t. 127, C. D (1799).

*Euplœa midamus* (part), Butl., Proc. Zool. Soc., 1866, p. 294, 76; Horsf. & Moore, Cat. Lep. Ins. Mus. E. I. C., i., p. 133, n. 265 (1857).

*Trepichrois mulciber*, Butl., Journ. Linn. Soc., Zool., vol. xiv., p. 296, 2 (1878).

Male. Closely allied to the male of *E. midamus*, but smaller, with the apical portion of the anterior wings less prominent, the submarginal spots above smaller, and the marginal spots absent; the reflections towards apex of the same wing are more violet than bright blue as in the other species. Beneath

\* Contribut. to Nat. Select., p. 87.

the anterior wings have the marginal spots faintly indicated; the posterior wings have the discal spots as in *E. midamus*, but the marginal and submarginal spots are obsolete or absent.

Female. Smaller than corresponding sex of *E. midamus*; the blue reflections to anterior wings much less prominent and more violaceous, and the white markings on both wings smaller and less prominent.

Exp. wings, ♂ 87 millim.; ♀ 87 to 94 millim.

HAB.—Malay Peninsula; Malacca (Brit. Mus.).—Borneo (Brit. Mus.; colls. Moore and Dist.).

*E. mulciber* is only here included on the strength of a female specimen, described as from Malacca, and contained in the British Museum. I have seen no other specimen from the Malay Peninsula, and it has hitherto been considered as the constant Bornean race or form of *E. midamus*, and peculiar to that island.

#### 6. *Euplœa ledereri*. (Tab. II., fig. 10.)

*Euplœa ledereri*, Felder, Wien. Ent. Mon., iv., p. 397, n. 14 (1860); Reise, Nov. Lep., ii., p. 317, n. 431, t. 40, f. 5, 6 (1865); Butl., Proc. Zool. Soc., 1866, p. 291, 66.

*Euplœa inquinata*, Butl., Proc. Zool. Soc., 1866, p. 291, n. 65; p. 288, fig. 2.

*Calliptœa ledereri*, Butl., Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 536, 3 (1877); Journ. Linn. Soc., vol. xiv., p. 295, 1 (1878).

Male. Anterior wings olivaceous-brown, becoming darker with dark blue reflections towards apex, and marked with the following bluish spots:—one between first and second subcostal nervules; one beyond cell above upper discoidal nervule; one above first median nervule; another in cell a little before lower discoidal nervule; and a submarginal row of five spots, of which the upper and subapical one is very large and irregularly shaped. Posterior wings with the base olivaceous-brown; remainder much paler, and with a pale discoidal patch. Underside of wings pale olivaceous-brown; anterior wings marked generally as above, but the spots white and smaller, the submarginal series having the large subapical spot above only indicated by a small spot beneath, and a more or less distinct (varying in different specimens) marginal series of very small spots. Posterior wings with the following white spots:—a submarginal series, of which the upper three are the largest, and which with the fourth are placed singly between the nervules, and a marginal series which does not extend to apex. Head and thorax above blackish; head and anterior portion of thorax spotted with white. Abdomen dark fuscous, spotted with bluish beneath; underside of head sternum, and legs black; palpi, sternum, and immediate base of wings spotted with white.

Exp. wings, ♂ 72 millim.

HAB.—Continental India; Assam (Warwick, Brit. Mus.).—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (coll. Dist.); Malacca (colls. Moore and Brit. Mus.).

I have not yet received a female specimen of this species, and both Felder and Butler described male specimens. It appears to be almost confined to the Malay Peninsula, especially if there should be any error in the locality of Assam as given by Mr. Warwick to the British Museum. According to Smith, it is also found in Sumatra.\*

*c. Males provided with a pseudo scent-gland or brand to anterior wings, and with a pale discoidal patch to posterior wings.*

#### 7. *Euplœa vestigiata*. (Tab. III., fig. 6 ♂, 7 ♀.)

*Euplœa vestigiata*, Butler, Proc. Zool. Soc., 1866, p. 288, n. 58, f. 1.

*Calliptœa vestigiata*, Butl., Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 535, 2 (1877).

\* Bock, 'Head Hunters of Borneo,' Appendix V., p. 336.



*Salpinx vestigiata*, Butl., Journ. Linn. Soc., Zool., vol. xiv., p. 293, 12 (1878).

Var. *Salpinx leucogonis*, Butl., Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 536, 1, t. 68, f. 5\* (1877).

Male. Anterior wings above very dark velvety blue, with the following pale bluish spots:—one between first and second subcostal nervules, one beyond cell between second discoidal and first median nervules; a submarginal series of five spots placed one above and one below fourth subcostal nervule, one above and one below upper discoidal nervule, and the other beneath lower discoidal nervule; a small and indistinct spot between second and third median nervules, a still smaller and more indistinct one beneath third median nervule, and an oblong streak of the same colour (which denotes the pseudo scent-gland or brand) placed beneath third median nervule. Posterior wing pale olivaceous-brown, much darker towards base, with a pale discoidal patch and three faintly indicated submarginal spots near apex, placed between the nervules. Underside of wings olivaceous-brown; anterior wings with the following pale bluish white spots:—one between first and second subcostal nervules; two beyond cell, divided by lower discoidal nervule; one large and subovate between second and third median nervules; three small and subapical, placed obliquely, which are apparently the commencement of a submarginal series, faintly indicated near median nervules; and a very faint, indistinct, and broken marginal series of small spots. Wing below third median nervule much paler. Posterior wings with a submarginal series of bluish white spots, the upper four of which are placed singly between the nervules, and a marginal series commencing near anal angle and not continued beyond first median nervule.

Female. Anterior wing above spotted as in male, but wanting the discal spot beyond cell, and with the costal base and inner margin slightly suffused with rufous. Posterior wings as in male, but wanting the pale discoidal patch, and possessing a marginal series of small spots near anal angle. Wings beneath generally as in male, but possessing only one spot beyond cell, and with the marginal and submarginal series of spots to anterior wing somewhat more distinct.

Male and female. Head and thorax above black; head and anterior portion of thorax spotted with white; head beneath, sternum, and legs black: palpi, sternum, and immediate base of wings spotted with white; abdomen dark fuscous, spotted beneath with bluish.

Exp. wings, ♂ and ♀ 98 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.); Sumatra (colls. Moore and Brit. Mus.); Java (coll. Dist.).

This appears to be a variable species, and is probably a *race* of the *E. novare*, Feld. Felder clearly defines this variability in his description; in fact, with the qualifications he there admits in the markings of several varieties, these Province Wellesley specimens (here described and figured) might almost be considered as agreeing with some of his Nicobarian types. This Malay form somewhat differs from Javan specimens of *E. vestigiata*, and appears to be intermediate between some varietal forms of *E. novare* and typical specimens of *E. vestigiata*, which Mr. Kirby † was probably correct in considering a variety of Felder's species. The *Salpinx leucogonis*, Butl., in my opinion, is a small female variety, but in Mr. Moore's collection, and also in the British Museum, I have seen males of *E. vestigiata* at least agreeing in the matter of size. ‡ When one is able to examine a long series of specimens, which is but seldom possible, modifications in specific conclusions generally ensue, which would otherwise have not been considered probable.

\* Butler's figure is somewhat misleading, the marginal spots to posterior wings having been enlarged and exaggerated by the artist, compared with those on the type specimen in the collection of the British Museum, which I have examined.

† Syn. Cat. Diurn. Lepid., p. 13 (1871).

‡ Since writing the above the small male of *E. vestigiata* contained in the British Museum, and placed by Butler as belonging to that species, has been, in agreement with the advice of Moore, replaced as the male of *E. leucogonis*. This affords further illustration of the close community of these forms.

8. *Euplœa dioeletianus*. (Tab. IV., fig. 4 ♂ and 5 ♀.)

*Papilio dioeletianus*, Fabricius, Ent. Syst., iii., 1, p. 40, n. 118 (1793).

*Danaïs dioeletianus*, Godt., Enc. Méth., ix., p. 181, n. 16 (1819).

*Euplœa rhadamanthus* (part), Horsf. & Moore, Cat. Lep. Mus. E.I.C., i., p. 126, n. 250 (1857); Butl., Proc. Zool. Soc., 1866, p. 296, n. 81.

*Euplœa dioeletianus* (part), Butl., Cat. Fabr. Lep., p. 2, n. 5 (1869).

*Calliphea dioeletianus*, Butl., Trans. Linn. Soc., ser. 2, Zool., vol. i., p. 535, n. 1 (1877).

*Salpinx dioeletianus*, Journ. Linn. Soc., Zool., vol. xiv., p. 294, n. 27 (1878).

*Danisepa dioeletianus*, Moore, MS.

Male. Anterior wings dark indigo-blue, with pale reflections towards outer margins, and with the following white spots:—two subcostal and linear, divided by first subcostal nervule, the inner one much the longest (in some specimens the last is preceded above by a narrow linear spot, situated above costal nervule, which is absent in the form figured); a very large and irregularly-shaped spot occupying apical portion of cell, followed by a small one placed between first and second median nervules (in some specimens, as in the one figured, this is preceded inwardly by a small pale bluish spot); a submarginal series of seven pale bluish spots, four subapical placed between the nervules, and three, which are very small, near anal angle; these are preceded by a large subquadrate spot between second and third median nervules, with a small one beneath it, both of which are also pale bluish, which is also the colour of the pseudo scent-gland or brand, situated beneath and parallel to third median nervule. Posterior wings dark indigo-blue, with the discoidal and costal area olivaceous-brown, and with the following pale bluish spots:—three submarginal near apex, the upper one small and somewhat indistinct (sometimes absent), a small spot at end of cell (in some specimens there are three), a marginal series of small spots near anal angle, preceded by two (and sometimes four) slightly larger spots; four elongate white fasciæ commencing near base, and situated two between third median nervule and submedian nervule, and two on abdominal margin. Underside of wings paler and more olivaceous, the bluish spots much paler, a large additional white spot between second and third median nervules, and with the pseudo scent-gland concolorous. Posterior wings marked as above, but with the submarginal spots more numerous and continuous; a long white streak and two linear spots in cell, and four linear white spots surrounding apical portion of cell. Head and thorax above black; head and anterior portion of thorax spotted and streaked with white. Abdomen dark bluish or fuscous above, the sides paler and spotted with pale bluish beneath. Underside of head, sternum, and legs black; palpi, sternum, and immediate base of wings spotted with white.

Female. Paler and more olivaceous above. Anterior wings with the submarginal spots much paler, the spot beneath apex of cell very large, and followed beneath second median nervule by a larger and more irregular spot, which is connected with the one near margin. Posterior wings with a marginal and submarginal series of very pale bluish spots; three large white streaks in cell, the apex of which is surrounded by five white spots, the two lower ones being longest, and with the four basal and abdominal fasciæ as in male. Underside of wings olivaceous-brown, marked and spotted generally as above, but with the two spots between second and third median nervules of anterior wing not united.

Exp. wings, ♂ 78 to 80 millim.; ♀ 75 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Penang; Malacca; Singapore (colls. Moore and Brit. Mus.).—Sumatra (coll. Moore).

This is evidently a Malay race of *E. rhadamanthus*, Fabr., a species which I follow Moore and Butler in considering as typically represented in Northern India. It possesses also another and very distinct Bornean race, described as *E. Lowii*. The principal difference between these three species or races is that of a gradually increasing melanism, which is least in the North Indian *E. rhadamanthus* and greatest in the Bornean form *E. Lowii*.

9. *Euplœa crassa*. (Tab. V., fig. 8.)

*Euplœa crassa*, Butler, Proc. Zool. Soc. 1866, p. 278, n. 31.

*Salpinx crassa*, Butler, Journ. Linn. Soc., Zool., vol. xiv., p. 295, n. 38 (1878); Moore, Proc. Zool. Soc. 1878, p. 822.

Male. Wings above olivaceous-brown, darker and with somewhat bright reflections at base. Anterior wings with a small white spot between first and second subcostal nervules; a submarginal series of five white and somewhat quadrate spots, with narrow, obscure, paler evanescent surroundings, placed between the nervules, the first and uppermost one of which is situated between the third and fourth subcostal nervules, and the lower one between the second discoidal and first median nervules; of these the third is the largest, and with the fourth and fifth more or less coalesce with a marginal series of smaller white spots, which are placed in pairs between the nervules, becoming smaller towards posterior angle, and (in the specimen described and figured) represented only by a single spot between first and second median nervules. Posterior wings with a pale ochraceous discoidal patch, extending through upper portion of cell, and with a marginal and submarginal series of white spots. Wings beneath slightly paler than above: anterior wings, in addition to the white spots between first and second subcostal nervules as seen above, with two small white spots beyond end of cell on each side of lower discoidal nervule, and with a larger spot of the same colour between second and third median nervules; the submarginal series are much smaller, but with the pale evanescent surroundings appearing larger; posterior wings marked as above. Head and thorax above very dark fuscous; head and anterior portion of thorax spotted with white; abdomen fuscous above, with the sides and under surface slightly paler; head beneath, sternum, and legs dark fuscous; palpi, sternum, and immediate bases of wings spotted with white.

Male with a short and somewhat obscure pseudo scent-gland or brand on anterior wings, between third median nervule and submedian nervure.

Exp. wings 93 millim.

HAB.—Continental India; Darjeeling (coll. Moore).—Burma; Pegu; Moulmein (coll. Moore).—Upper Tenasserim (Limborg).—Malay Peninsula; Quedah (coll. Dist.).—Siam (Brit. Mus.).

It seems at least uncertain whether this species is not identical, and if so synonymic, with *E. erichsonii*, Felder,\* as so considered by Mr. Kirby.† Felder's habitats "India Septentrionalis, Cochin," would also favour this view. Mr. Butler, however, has identified a closely-allied form as *E. erichsonii*, and as Felder has not figured his species, and his types are not easily accessible for comparison, I have provisionally followed this view here and adopted Butler's name.

It is probable that this species does not extend farther south than Quedah, from which our collectors obtained a single specimen. I did not meet with it myself when collecting in Province Wellesley, nor have I seen it in any collections from that district or Malacca.

10. *Euplœa dejeani*. (Tab. IV., fig. 1.)

*Isania Dejeanii*, Moore, MS.

*Euplœa chloe*, var. ??

Male. Wings above olivaceous-brown, darker towards base. Anterior wings with a small whitish marginal spot, situate beneath third median nervule. Posterior wings with a pale coloured patch near basal costal margin, which is almost entirely hidden by inner margin of anterior wings, and with a marginal and submarginal series of white spots. Underside of wings a little paler than above; anterior

\* Reise Nov. Lep. ii. p. 324, n. 444.

† Syn. Cat. Diurn. Lep. p. 11, n. 38 (1871).

wings with the following pale bluish spots:—a small spot between first and second subcostal nervules; a somewhat larger spot in cell, a little before lower disco-cellular nervule; a similar one between first and second median nervules, and an irregular subovate patch between second and third median nervules; faint indications of a marginal and submarginal series of whitish spots, distinct and prominent at anal angle, again visible above first median nervule, and totally wanting at apex. Posterior wings beneath with the marginal and submarginal spots as above, and with five small and indistinct spots surrounding apical portion of cell, and situate between the nervules. Head and thorax above black. Head and anterior portion of thorax spotted with white. Abdomen fuscous, spotted with pale bluish beneath. Head beneath, sternum, and legs black; palpi, sternum, and extreme base of wings spotted with white.

Anterior wings provided with an elongate pseudo scent-gland or brand, situate between third median nervule and submedian nervure.

Exp. wings 86 millim.

HAB.—Malay Peninsula; Malacca (coll. Godm. & Salv.).—Sumatra (coll. Oberthür).

It is quite possible that this form may be but an extreme variety of *E. chloe*. I have seen but two examples—one from Malacca, in the collection of Messrs. Godman and Salvin, which is here described and figured; the other from Sumatra, in the collection of Mon. Oberthür, which had been forwarded to Mr. Moore for identification, and for which that entomologist had proposed the name which I have used here.

NOTE.—In the figure here given (Tab. IV., fig. 1) the pseudo scent-gland or brand on anterior wing has failed to appear in the last chromatic impression.

#### 11. *Euplœa chloe*. (Tab. IV., fig. 2 ♂. Tab. II., fig. 5 ♀.)

*Euplœa Chloë*, Guérin, Deless. Souv. Inde, ii. p. 71 (1843); Butl., Proc. Zool. Soc. 1866, p. 271, n. 7; Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 535, n. 5 (1877).

*Salpinx chloë*, Butl., Journ. Linn. Soc., Zool. vol. xiv. p. 295, n. 37 (1878).

*Isamia chloe*, Moore, MS.

Male. Anterior wings above dark olivaceous-brown, basal half much darker, with obscure violaceous reflections; a subapical, arcuated series of five white spots, the upper two divided by the fourth subcostal nervule; third and largest situated beneath fifth subcostal nervule; fourth and fifth smallest, with the upper discoidal nervule intervening (beneath these are faint indications of a submarginal series of small spots), and a marginal series of small white spots, becoming obsolete towards apex. Posterior wings above olivaceous-brown, with a submarginal and marginal series of small white spots, the submarginal series much obliterated, but in some specimens distinct and continuous. Underside of wings pale olivaceous-brown; anterior wings with the following bluish white markings on disk:—a small spot between first and second subcostal nervules (sometimes this is accompanied by one or two others, as in the female); a similar spot in cell, before lower disco-cellular nervule; a spot between first and second median nervules, and a large irregularly shaped streak between second and third median nervules; marginal and submarginal spots as above, but larger, more distinct, and continuous. Posterior wings with a pale discoidal patch near basal costal margin, which is for the most part hidden by inner margin of anterior wings; spotted as above, but with the submarginal spots distinct and continuous, and having five additional and distinct discal spots, which surround the apical portion of cell. (In some specimens there is a very small but distinct spot in and before end of cell, and sometimes a sixth surrounding spot situated above first subcostal nervule.) Head and thorax above black; the head and anterior portion of thorax spotted with white. Abdomen fuscous, spotted with pale bluish beneath. Head beneath, sternum, and legs black; palpi, sternum, and extreme base of wings spotted with white.

Anterior wings above provided with an elongate pseudo scent-gland or brand, situate between third median nervule and submedian nervule.

Female. Generally larger in size, with the marginal and submarginal spots more distinct above. Wings beneath marked generally as in male, but with three central spots on anterior wing near costal margin. Posterior wings having the spot in cell distinct, and also the sixth surrounding spot to apical portion of cell.

Exp. wings, ♂ 88 to 96 millim.; ♀ 103 to 110 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (coll. Godm. & Salv., and Brit. Mus.).—Singapore (Brit. Mus.).—Sumatra.—Java (coll. Moore).

From an examination of a series of specimens, collected in the Malay Peninsula, much macular variation is apparent, and it is probable that the constancy of these characters have been much over-estimated in discriminating species of *Euplœa*. In the male specimen here figured from Malacca (Tab. IV., fig. 2) the marginal and submarginal spots are much obliterated on the upper surface of the wings. In some male specimens, however, from Province Wellesley these spots are as prominent and distinct above as in the female figured (Tab. II., fig. 5).

## 12. *Euplœa margarita*. (Tab. IV., fig. 3.)

*Euplœa margarita*, Butler, Proc. Zool. Soc. 1866, p. 279, n. 34; Druce, Proc. Zool. Soc. 1874, p. 103, n. 6; Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 535, n. 4 (1877).

*Salpinx margarita*, Butl., Journ. Linn. Soc. vol. xiv. p. 294, n. 34 (1878); Moore, Proc. Zool. Soc. 1878, p. 823. *Isamia margarita*, Moore, MS.

Male. Anterior wings with about basal four-fifths of area deep violaceous, from thence to outer margin ferruginous; a small bluish spot near costa, between first and second subcostal nervules, and one in and near end of cell; indications of a marginal but obsolete series of small spots, denoted by one or two near anal angle and sometimes two pale submarginal obscure spots, situate on each side of second discoidal nervule. Posterior wings ferruginous, with a marginal and submarginal series of white spots, and a pale discoidal patch near costal base, which is almost hidden by the inner margin of the anterior wings. Wings beneath pale ferruginous. Anterior wings with the following pale bluish spots and markings:—a small spot between first and second subcostal nervules, and a larger one before end of cell (as above); beneath the last is a similar spot between the first and second median nervules, and a long subovate streak between second and third median nervules; a much obliterated marginal and submarginal series of very small spots. Posterior wings marked as above, with the addition of a discal series of six small spots, one in and near end of cell, and five surrounding apical portion of cell, divided by the nervules. Head and thorax above black; anterior portion of thorax and head spotted with white; abdomen dark fuscous, spotted beneath with bluish white; head beneath, sternum, and legs black; palpi, sternum, and extreme base of wings spotted with bluish white.

Anterior wings above provided with an elongate pseudo scent-gland or brand, situate between third median nervule and submedian nervule.

Female. Completely resembling other sex, but in my specimen possessing on upper surface of anterior wings two additional small bluish spots beneath apex of cell, and divided by second median nervules.\*

Exp. wings 86 to 102 millim.

HAB.—Burma; Moulmein (coll. Moore).—Upper Tenasserim (Limborg).—Malay Peninsula; Penang; Malacca (Brit. Mus.).—Siam (coll. Godm. & Salv.).

\* It is very probable that these discoidal spots on upper surface of anterior wings are variable in number in both sexes.

Mr. Butler, in his original description of this species, gave its habitat as "East Indies." It has probably, however, but a limited area of distribution, possibly not extending above Burma in the north, nor beyond the confines of the Malay Peninsula in the south.

Messrs. Godman and Salvin possess a curious male variety of this species from Malacca, which has on the upper and under sides of the anterior wings a submarginal series of seven white spots placed between the nervules, and has the marginal series of spots continuous and moderately distinct; the spot in the cell beneath is also visible above. I possess a female form in my own collection (unfortunately without a locality) which agrees with the same.

D. *Males provided with a pseudo scent-gland or brand to anterior wings, but not possessing a pale discoidal patch to posterior wings.*

### 13. *Euplœa distanti*. (Tab. V., fig. 9 ♂.)

*Crastia Distantii*, Moore, Ann. & Mag. Nat. Hist. ser. V. June, 1882, p. 453.

Male. Wings above dark olivaceous-brown; anterior wings with the basal area darker and with the following white spots:—a submarginal series of eight spots, of which three are small, subcostal, and placed between the second, third, fourth and fifth subcostal nervules, fourth and fifth largest and situate on each side of upper discoidal nervule, the following three smaller, rounded, and placed one above and one below first median nervule, and one below second median nervule, and a marginal series of smaller spots placed in pairs between the nervules. Posterior wings more uniformly and palely olivaceous-brown, with a submarginal and marginal series of small white spots, the first becoming indistinct and obsolete towards anal angle. Wings beneath olivaceous-brown. Anterior wings marked as above, with the addition of four discal and very pale violaceous spots, one between first and second subcostal nervules, one in and before lower end of cell, one beneath end of cell between first and second median nervules, and the fourth largest and elongate between second and third median nervules. Posterior wings with the submarginal and marginal series of spots continuous and distinct, and with the following small and very pale violaceous spots:—one in and before end of cell, and six surrounding apical portion of cell, divided by the nervules. Head and thorax above blackish; head and anterior portion of thorax spotted with white; abdomen dark fuscous above, somewhat paler beneath; head beneath, sternum, and legs blackish; palpi, sternum, and extreme base of wings spotted with white.

Male with a dark elongate pseudo scent-gland or brand on upper surface of anterior wings, between third median nervule and submedian nervure.

Female. Wings above paler and more unicolorous olivaceous-brown; anterior wings with the marginal and submarginal spots as in male, but larger and with a ninth submarginal spot beneath third median nervule; there are also three very small discal spots, one between first and second subcostal nervules, one between first and second median nervules, and one in and a little before lower end of cell (there is also a faint indication of a fourth between second and third median nervules); posterior wings with the submarginal and marginal spots much larger than in male. Wings beneath spotted as in male, but the marginal and submarginal spots much larger, and with an additional narrow streak or spot between first and second subcostal nervules, and a similar one beyond end of cell, between lower discoidal and first median nervules of anterior wings.

Exp. wings, ♂ 84 millim.; ♀ 85 millim.

HAB.—Malay Peninsula: Province Wellesley (coll. Dist.).—Sumatra (coll. Moore).—Java (coll. Dist.).

I have only procured one male specimen from Province Wellesley, and my solitary female example is from Java. The male has a very considerable superficial resemblance to *E. bremeri*,

but the presence of the pseudo scent-gland or brand to anterior wings will at once separate it from that species. It is at least a question whether the term "mimicry" should be used here, both species belonging (as I consider, and most entomologists till recently considered) to the same genus. All the species of *Euplwa* with which we are acquainted, and as Mr. Wallace has informed us, have, with the remaining *Danaine* of the Old World tropics, the "same protective odour."\* In this case, if we adopt the explanation of mimicry for the resemblance of these two species, we must presumably consider *E. distanti* as the mimicked species, as it possesses a pseudo scent-gland, which may reasonably be considered as adding to its protective or uneatable character, and which is absent in *E. bremeri*. We thus have the "mimicking" very much more abundant than the "mimicked" species, which is contrary to the usually observed phenomena, though Fritz Müller has recorded some similar exceptions as occurring in Brazil,† and the same observer has also endeavoured to show that there is an advantage in two nauseous species resembling each other, as occurs between two American species, both of which belong to genera which are protected from birds and other enemies by distasteful qualities.‡ Such propositions are of course at present hypothetical, and are at least supplementary to the carefully observed facts on which Mr. Bates originally disclosed and argued the admirable doctrine of "mimicry,"§ which accounted for the strange external resemblances, long known to entomologists, which existed between insects belonging to distinct genera, families, and even orders, between which there was no real affinity. In the great genus *Papilio* we certainly have species mimicking each other, but these belong to different sections of the genus, many instances of which have been pointed out by Mr. Wallace,|| and other examples have been recently given by Mr. Wood-Mason¶ of species belonging to scentless groups mimicking those which are strong-scented and inedible. But in the genus *Euplwa* we have at present no knowledge of non-nauseous or non-protected species, and therefore the probability of the species "mimicked" being *E. distanti*, because of its possession of a pseudo scent-gland, and hence presumably protective advantage, is somewhat negated by the fact that some *Euplwas* without these glands are mimicked by other and very divergent species, as notably *E. midamus* by *Papilio paradoxa* and *P. unigma*. The possession of these glands does not therefore appear necessary for distastefulness and protection; and hence, until further observations are made by careful observers, it seems at least rash to predicate "mimicry," in the sense used by its discoverer, as the explanatory cause of these resemblances amongst the species of *Euplwa*. The original argument that butterflies which were known by observation to be uneatable or protected were mimicked in appearance by different butterflies which did not possess distasteful qualities for the sake of a similar protection, does not warrant the conclusion that because two or more butterflies or other insects (of not or the

\* Contrib. to Nat. Select. p. 85 (1870).

† Ann. & Mag. Nat. Hist. ser. 5, vol. i. p. 157 (1878); 'Kosmos,' 1879, p. 100; and Proc. Ent. Soc. 1879, p. xxiv.

‡ Müller's views have since been amplified and approved by Mr. Wallace, which gives them no inconsiderable strength ('Nature,' vol. xxvi. p. 86).

§ This word seems to have been first used in a biological sense by Prof. Henfrey, in his translation of Schouw's 'Earth, Plants, and Man' (1852), and in reference to Botany. In discussing "repetitions in the vegetable kingdom" he remarks (p. 61). "There is still another kind of repetition which I might call 'habitual repetition,' or denominate 'mimicry.'" Both author and translator, however, missed its philosophical application.

|| Contrib. to Nat. Select. pp. 87, 88.

¶ Ann. & Mag. Nat. Hist. ser. 5, February, 1882, pp. 104, 105.

same genus) resemble each other, therefore, *without observation of the fact*, it is proved that one must be protected or uneatable and the other or others are mimickers.

14. *Euplœa godarti*. (Tab. III., fig. 8.)

*Euplœa Godartii*, Lucas, Rev. Zool. 1853, p. 319; Butl., Proc. Zool. Soc. 1866, p. 275, n. 22; Journ. Linn. Soc., Zool. vol. xiv. p. 301, n. 37 (1878); Moore, Proc. Zool. Soc. 1878, p. 824.

*Euplœa siamensis*, Felder, Reise Nov. Lep. ii. p. 341, n. 473, t. 41, f. 6 (1865); Druce, Proc. Zool. Soc. 1874, p. 103, 5.

*Crastia godartii*, Moore, MS.

Male. Anterior wing olivaceous-brown, darkest towards base, and with the apex broadly lilaceous. Posterior wings olivaceous-brown, with a marginal and submarginal row of pale spots. Wings beneath olivaceous-brown; anterior wings with four pale whitish discal spots, the first situated between first and second subcostal nervules, the second in cell a little before lower disco-cellular nervule, third between first and second median nervules, and fourth and largest between third median nervule and submedian nervure; a few marginal white spots near anal angle (in a second unlocalised male specimen in my collection there are traces of a submarginal row of spots, distinct near apex and anal angle). Posterior wings with the marginal and submarginal spots as above, but much paler; a small bluish white spot in and near end of cell, and a series of four spots of the same colour beyond cell and placed between the nervules (in some specimens there are six of these spots). Head blackish; thorax above and abdomen fuscous. Head and anterior portion of thorax spotted with white; underside of abdomen spotted with bluish white. Head beneath, sternum, and legs blackish; palpi, sternum, and extreme base of wings spotted with white.

Anterior wings provided with an elongate pseudo scent-gland or brand, situate between third median nervule and submedian nervure.

Female. I have as yet been unable to examine a female specimen from the Peninsula, and as the male here described is of a somewhat varietal character I hesitate to give the diagnosis of the other sex from a different habitat.

Exp. wings, ♂ 86 millim.; ♀ 94 millim.

HAB.—Burma; Moulmein.—Upper Tenasserim (coll. Moore).—Malay Peninsula; Singapore (coll. Godm. & Salv.)—Siam (Brit. Mus.); Chentaboon (coll. Godm. & Salv.)—Cochin (coll. Feld.)—Philippines (Brit. Mus.)

The specimen here figured and described is contained in the Godman and Salvin collection, is labelled "Singapore," and was received from Mr. Druce. It is the only example of the species I have yet seen from the Malay Peninsula. As will be seen from the description, it is a somewhat varietal form, but until we have seen more specimens from the locality, it would be extremely hazardous to consider it constant in that respect, especially as we have already seen that these macular characters are generally of an inconstant and variable nature in other species.

15. *Euplœa ménétriési*. (Tab. III., figs. 4 ♂ & 5 ♀.)

*Euplœa Ménétriésii*, Felder, Wien. Ent. Mon. iv. p. 398, n. 15 (1860); Butl., Proc. Zool. Soc. 1866, p. 275, n. 18; Druce, Proc. Zool. Soc. 1874, p. 103, n. 4; Butl., Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 535, n. 7 (1877); Journ. Linn. Soc., Zool., xiv. p. 301, n. 44 (1878).

*Penoa ménétriési*, Moore, MS.

Male. Anterior wings dark pitchy brown, with velvety reflections, and becoming very slightly paler at outer margins. Posterior wings olivaceous-brown, much darker near base, and with a very faint and



obscure series of narrow, elongate submarginal spots, followed by a marginal series of smaller, somewhat rounded, and equally obscure spots. Wings beneath pale olivaceous-brown, somewhat darker towards base. Anterior wings with the following bluish white spots:—one above and one beneath second subcostal nervule, and another beneath the origin of third subcostal nervule (these last two spots are present in the specimen figured, but, judging from my other examples, are more frequently absent); a spot in cell before lower disco-cellular nervule; a similar one between first and second median nervules, and a larger and more elongate spot between second and third median nervules; near posterior angle are sometimes a few very small and indistinct white marginal spots. Posterior wings with the obscure marginal and submarginal spots distinct and white beneath, and with the following pale bluish discal spots:—one in and near end of cell, and five (in some specimens six) surrounding apical portion of cell and situated between the nervules. Head, thorax, and abdomen above blackish; head and anterior portion of thorax spotted with white; body beneath and legs blackish; palpi, sternum, and extreme bases of wings spotted with white; abdomen beneath spotted and subannulated with bluish white.

Male with an elongated pseudo scent-gland or brand on anterior wings, between third median nervule and submedian nervule.

Female. Wings above paler than in male, olivaceous-brown, and unicolorous; posterior wings with the submarginal and marginal series of spots distinct and white above. Wings beneath pale olivaceous-brown; anterior wings spotted as in male, but with an additional submarginal series of smaller spots. Posterior wings spotted and marked as in male sex, but with the marginal and submarginal series of spots somewhat larger and extending to apex.

Exp. wings, ♂ 80 to 85 millim.; ♀ 90 millim.

HAB.—Continental India; Assam (Warwick, Brit. Mus.)—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.)—Siam; Chentaboon (coll. Godm. & Salv.)—Sumatra (Hewits.; Smith).—Borneo (coll. Dist.)

The males are somewhat inconstant in size, and have frequently the marginal and submarginal spots on the upper surface of the lower wings almost obsolete, and sometimes nearly as distinct as in the female.

## 16. *Euplœa pinwilli*. (Tab. III., fig. 9 ♂, & var. fig. 10 ♂.)

*Euplœa Pinwilli*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 535, n. 8, pl. lxxix. fig. 9 (1877); Journ. Linn. Soc., Zool. vol. xiv. p. 301, n. 43 (1878).

*Penou Pinwilli*, Moore, MS.

Male. Anterior wings above dark pitchy brown, with very slight and obscure purplish reflections. The pseudo scent-gland, situated between third median nervule and submedian nervule, large, silky, and paler in hue. Posterior wings much paler and olivaceous-brown, with a marginal and submarginal series of whitish spots, the marginal ones small and rounded, the submarginal series becoming much larger and elongate from first median nervule to anal angle, where they are also paler in hue. Underside of anterior wings much paler than above, with the following violaceous spots:—one between first and second subcostal nervules; one in cell a little before lower disco-cellular nervule; two beyond end of cell, one on each side of first median nervule, and a larger, more elongate, and whitish spot between second and third median nervules. There are also a few white dots near posterior angle, and in some specimens, as the one here figured, one near apex. Underside of posterior wings with the marginal and submarginal series of spots much more distinct, paler, and slightly larger than above, and with the following small pale violaceous spots on disk, one in and a little before end of cell, and six (in some specimens seven) surrounding apical portion of cell, and placed between the nervules. Head and thorax above blackish; abdomen fuscous,

spotted with white beneath: head beneath, sternum, and legs blackish; head above, anterior portion of thorax, palpi, sternum, and extreme base of wings spotted with white.

Exp. wings, ♂ 92 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.)

This species varies much in the colour of the marginal and submarginal series of spots to the upper surface of the posterior wings, as occurs in the preceding species. In some specimens these are white, as in the variety figured. It is closely allied to *E. ménétrési*, from which its constantly larger size appears to be the strongest differential character. Butler describes it as being darker than *E. ménétrési*, but this does not apparently obtain when series of both species from the Malay Peninsula are compared.

*E. Males provided with two pseudo scent-glands or brands to anterior wings, but not possessing a pale discoidal patch to posterior wings.\**

### 17. *Euplœa grotei*. (Tab. III., fig. 3.)

*Euplœa grotei*, Felder, Reise Nov. Lep. ii. p. 339, n. 470, t. 41, fig. 7 (1865); Butl., Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 535, 3 (1877).

*Stictoplaea grotei*, Butl., Journ. Linn. Soc., Zool. vol. xiv. p. 302, 4 (1878); Moore, Proc. Zool. Soc. 1878, p. 824.

Male. Anterior wings dark violaceous, with a submarginal row of eight small pale violaceous spots situated between the nervules, and a marginal row of small spots which are almost white near posterior angle, and do not extend more than half way between that angle and apex. Posterior wings ferruginous, with a submarginal and marginal row of white spots, of which the first are the largest and become fused with the marginal series near anal angle. Wings beneath pale ferruginous; anterior wing with two small bluish spots near end of cell, the first situated between first and second subcostal nervules, the second above first discoidal nervule; three larger spots of the same colour on disk, the first inside and a little before end of cell, remaining two beneath cell and on each side of second median nervule; marginal and submarginal spots as above, but smaller, paler and becoming obsolete towards apex. Posterior wings with a discal series of eight small pale bluish spots, situate two beneath costal nervure, followed by five surrounding apex of cell, and divided by the nervules, and one in and near apex of cell; marginal and submarginal spots as above. Head and thorax blackish; anterior portion of upper surface of thorax and head spotted with white; abdomen blackish, spotted with bluish beneath; sternum and legs black; palpi, sternum, and extreme bases of wings spotted with bluish white.

Anterior wings above, with two long and subparallel pseudo scent-glands or brands situate between third median nervule and submedian nervure.

Exp. wings 80 to 95 millim.

HAB.—Burma; Moulmein (coll. Moore).—Upper Tenasserim (Limborg).—Malay Peninsula; Malacca (Brit. Mus.)—Cochin (coll. Felder).

This species appears to be somewhat scarce in the Malay Peninsula. The British Museum possesses Malaccan specimens collected by Capt. Pinwill; but I neither captured it myself in Penang or Province Wellesley, nor have I yet received examples from those localities. Its area appears to be comprised between Cochin and Burma in the north, and extending probably almost throughout the Malay Peninsula in the south.

\* I am much indebted to my friend Mr. Moore for having drawn my attention to the value of these characters; which I have here used for the purposes of sectional division.

## Subfam. SATYRINÆ.

*Satyriac*, Bates, Journ. Ent. ii. p. 176 (1864); Moore, Lep. Ceyl. i. p. 13 (1881).

*Satyridæ*, Swains., Cab. Cycl. pp. 86, 93 (1840); Westw., Gen. Diurn. Lep. p. 352 (1851); Trimen, Rhop. Afr. Austr. p. 184 (1862).

*Eurytelidæ* (part), Westw., Gen. Diurn. Lep. p. 403 (1851).

*Elymiina*, Herr.-Schaff., Prodr. Syst. Lep. i. p. 15 (1864).

*Elymiina*, Kirby, Cat. Diurn. Lep. p. 112 (1871).

Discoidal cell of the hind wing closed. Palpi of the imago generally compressed and fringed with long hair-scales. Larvæ smooth and spineless, with the tails bifid.

This widely dispersed and cosmopolitan subfamily possesses several characters of both interest and importance, as demonstrative of its distinctive position.

The smooth spineless larvæ, with bifid tails, are also found in the allied subfam. *Brassoliac*,\* and likewise occur in the subfam. *Nymphalinc*, of which the genera *Apatura* and *Charaxes* may serve as examples. These larval coincidences in the different subfamilies may be well observed by a study of Dr. Horsfield's classification, that author having, on similar but less rigid larval characters, founded his *Thysanuriform* group.† Mr. Newman, dealing with the same affinities,‡ described these larvæ as "slug-shaped caterpillars" (*Limaciformes*), and as examples figured those of *Apatura iris* and two species of *Satyriac*. Dr. Weisman has also noticed this incongruence.§ This form of larva, however, is constant throughout the *Satyriac*, thus exhibiting—to use the good English equivalent given for a German term of Dr. Weisman—a "congruence" of larval characters. They are almost all feeders on various grasses, to which their green coloration and markings assimilate them, thus affording a good example of "protective coloration." In an evolutionary sense there are also ample grounds for considering them as exhibiting a very primitive form. Dr. Weisman has made the most profound and philosophical study of larval characters, principally as found in the *Sphingidæ*, a family which strongly exhibits more or less specialised larval markings. He considers the oldest Sphinx larvæ as being without markings and probably protected only by adaptive coloration and a large caudal horn, &c. It is at least probable that the bifid tails of the *Satyriac* fulfil an analogous protective function with this caudal horn in the *Sphingidæ*, or with the forked horn at the tails of the larvæ of some genera of moths. With the next stage of Sphingid evolution, where the larvæ have become longitudinally striped, we may almost apply Dr. Weisman's very words to the *Satyriac*:—"The caterpillars thus marked must have been best hidden on those plants in which an arrangement of parallel linear parts predominated; and we may venture to suppose that at this period most of the larvæ of the *Sphingidæ* lived on or among such plants (grasses)." ||

\* This subfamily is confined to Tropical America.

† Descrip. Cat. Lep. Ins. pp. 21-2.

‡ 'British Butterflies,' pp. 19 & 20.

§ 'Studies in the Theory of Descent,' p. 438 (Eng. ed.). Dr. Weisman, however, errs in stating that the imagines of the genera *Apatura* and *Nymphalis* differ from those of the *Satyriac* chiefly "in the absence of an enlargement of certain veins of the fore wings, an essential character of the *Satyriac*," as the enlargement of these veins is not a constant character, whilst the more or less atrophied disco-cellular nervules of the posterior wings in all the genera of the *Nymphalinc* is a constant and easily observed character to separate that subfamily from the *Satyriac*.

|| 'Studies in the Theory of Descent,' p. 381.

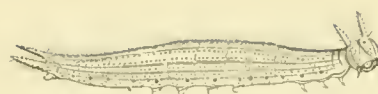


FIG. 8. Larva of *Melanitis leda*. (From Horsf. & Moore, Cat. Lep. Mus. E. I. C.)



FIG. 9. Head, showing palpi (greatly magnified) of *Melanitis ismenis*.

As regards the distribution of the *Satyrinae*, Prof. Westwood has calculated that the number of the European species is considerably greater than one-third of the whole number of European *Rhopalocera*,\* whilst Mr. Kirby estimates them as nearly a third.† It is in this region that the lower forms of grasses are very abundant, for, as Meyen has pointed out, these (the grasses which form meadows and pastures) are peculiar to the colder regions and to the colder half of the temperate regions; they are replaced by larger arborescent forms in the subtropical zone and within the tropics.‡ This large percentage of *Satyrinae* to the whole Rhopaloceros fauna probably extends throughout the Palearctic region, § but of the butterflies of Northern and Central Asia we still know very little. Even in China, Mr. Pryer, giving the results of a short entomological excursion, says, “The commonest butterfly was one of the *Satyridae*, which subsequently turned out to be not only a new species, but a new genus.”|| It cannot, however, be postulated that the average numerical distribution of the grasses is in proportion to the average numerical distribution of the *Satyrinae*, for whereas, according to De Candolle’s statistical review, the Old World and Asia especially is richer in grasses than the New, for though in the latter the grasses rarely amount to as much as ten per cent. of all the flowering plants in the various districts, usually only nine, occasionally only seven per cent., they generally amount to ten and often to twelve per cent. in the Eastern Continents.¶ I found from an estimate made from Mr. Kirby’s Catalogue (1871) that the approximate equivalence in the number of genera and species as found in the Old and New Worlds\*\* was exceedingly close and quite surprising in that respect. However, the number of genera peculiar to Tropical America are greater than those which are peculiar to any other region, the Oriental Region being next in that respect, but only to less than half the extent.††

According to Dr. Thwaites,‡‡ the Ceylonese specimens of *Satyrinae* are inactive and fly near the ground, amongst grass and close to the margins of woods. Their movements, however, are more lively in the early morning and evening during their amatory gambols.§§ They have also been observed on the Amazons by Mr. Wallace,||| and in South Africa by Mr. Trimen,¶¶ whose record of their flight is similar to that of Dr. Thwaites, and agrees with my own observations in Province Wellesley. Mr. Wallace adds to his Amazonian account that he did not remember to have ever seen any species rise four feet from the earth, whilst the greater number of them did not exceed as many inches; and Mr. Trimen noticed that those species which did not possess the basal inflation of the nervures of the anterior wings possessed greater powers of flight and a more robust structure generally.

The colour of these butterflies is generally of a sombre hue, dull brown being the usual tint of the upper surface, though exceptions to this rule, as might be expected, are not infrequent. There often appears to be some correlation between obscure colours above and ocellated spots beneath.

\* Doubl. & Westw., Gen. Diurn. Lep. vol. ii. p. 352.

| ‘European Butterflies,’ p. 45.

† ‘Botanical Geography’ (Ray Soc.), p. 107.

§ These statistics do not apply to the Nearctic Region, for Mr. Scudder, in discussing the disparity in numbers of the *Nymphalidae* of Europe and N. America, remarks that such “is almost wholly due to the vast number of Satyrs, or Meadow Browns in Europe—it has seventy-seven species—while we have but nineteen.”—‘Butterflies,’ p. 264.

|| Ent. Mo. Mag. xiv. p. 54.

¶ Quoted by Peschel, ‘The Races of Man,’ p. 412.

\*\* The Satyrid faunas of the Nearctic and Neotropical Regions were compared with those of the Palearctic, Ethiopian, and Oriental Regions.

†† Wallace, Geogr. Distrib. An. vol. ii. p. 471.

‡‡ Lep. Ceylon, i. p. 13.

§§ Mr. Swinton, who has paid much attention to this branch of Entomology, states that many butterflies pair at noontide when the sky is overcast (‘Insect Variety,’ p. 92).

||| Trans. Ent. Soc. 1857, p. 261.

¶¶ Rhop. Afr. Austr. p. 185.

Mr. Grant Allen has advocated the view of a correlation between the colours of animals and the food on which they feed. "Where bright blossoms are common insects are brilliant, while where most blossoms are inconspicuous most insects are dingy."\* "In short, the immense majority of animals which do not feed on bright-coloured food are of plain hues, &c." † Mr. Allen has greatly relied on the brilliancy of flower-frequenting butterflies in support of his theory, which might also have been assisted by a reference to the generally sombre-hued *Satyrinae*, whose home and sustenance are the wind-fertilised grasses, with their obscure and degenerate flowers. ‡

Seven genera only can at present be included in this fauna, which is doubtless an insufficient enumeration.

## SYNOPSIS OF GENERA.

1. First and second subcostal nervules of anterior wings emitted before end of cell.
  - A. Posterior wings with their outer margins more or less waved and obtusely angulated.
    - a. Median nervules of anterior wings with their bases widely separated.
      - b. Costal nervules of anterior wings not dilated.
        - c. Nervules of posterior wings all well separated at their bases.
          - d. Lower disco-cellular nervule of posterior wings distinctly longer than the upper one. - - - - - MELANITIS.
      - bb. Costal nervules of anterior wings dilated towards base.
        - e. Wings beneath provided with perfect ocelli.§
      - cc. First and second median nervules of posterior wings with a common origin at apex of cell.
        - dd. Disco-cellular nervules of posterior wings about or almost subequal in length.
          - f. Antennæ distinctly clavate. - - - - - LETHE.
          - ff. Antennæ slender, the apical portion gradually but slightly thickened.
            - ddd. Lower disco-cellular nervule of posterior wings distinctly longer than the upper one. - - - - - CÆLITES.
        - ccc. First and second median nervules of posterior wings approximating, but considerably separated at their origin; the first only at apex of cell. - - - - - ERITES.
      - aa. First and second median nervules of anterior wings with a common origin at apex of cell.
        - cc. Posterior wings without (or sometimes provided with imperfect) ocelli.
          - cccc. First and second median nervules of posterior wings with a common origin at apex of cell. - - - - - ELYMNIAS.
    - B. Posterior wings with their outer margins sometimes more or less waved, but not angulated or tailed.
      - bbb. Costal and sometimes also median and submedian nervules dilated at base.
        - g. Males provided with long hair-covered pseudo-scent-glands. - - - - - MYCALESIS.
  2. First subcostal nervule only of anterior wing before end of cell. - - - - - YPTHIMA.



FIG. 10. Posterior wing, *Melanitis ismene*, showing median nervules.



FIG. 11. Post. wing, *Lethe europa*, showing median nervules.



FIG. 12. Post. wings, *Erites angularis*, showing median nervules.



FIG. 13. Anterior wing, *Melanitis ismene*, showing median nervules.



FIG. 14. Ant. wing, *Elymnias casiphone*, showing median nervules.

\* 'The Colour Sense,' p. 160.

† Ibid. p. 181.

‡ The story of degeneracy of these flowers has been recently well told in the 'St. James's Gazette' (May 8, 1882), under the title of "The Flowering of the Grasses," by a skilful biologist, using the *nom de plume* of 'Colin Clout.'

§ I here use the term "ocelli" for brevity, preferring that of "ocellated spots," as elsewhere applied in the text. Although the first term is used by many excellent lepidopterists, still it has an earlier and distinct entomological definition, especially in *Rhynchota*.

## Genus MELANITIS.

*Melanitis*, Fabricius, Illiger's Mag. vi. p. 282 (1807); Moore, Lep. Ceyl. i. p. 14 (1881).

*Hipio*, Hübn., Verz. bek. Schmett. p. 56 (1816).

*Cyllo*, Boisd., Voy. Astrol. Lep. p. 140 (1832); Faune Mad. p. 57 (1833); Westw., Gen. Diurn. Lep. p. 360 (1851); Trimen, Rhop. Afr. Austr. p. 186 (1866).

Anterior wings short and broad, with the costa strongly arched and convex, and with the apex produced and usually angulated about lower discoidal nervule, beneath which the outer margin is distinctly excavated; inner margin nearly straight: first and second subcostal nervules emitted before the end of cell; upper disco-cellular nervule strongly produced and directed outwardly, abruptly deflexed and convexly bent at apex; lower disco-cellular abruptly curved inwards near commencement, and then, and for its greatest length, slightly directed outwardly. Posterior wings irregularly subovate, with the outer margin waved and produced into an obtuse angle or tail near first median nervule; nervules all well separated at their origins; lower disco-cellular nervule distinctly longer than the upper. Eyes naked. Palpi clothed beneath with short scaly hairs placed close together—squamose. Antennæ more or less incrassated at apex.

This genus is widely distributed, being found in Western, Southern, and Eastern Africa, throughout Continental India, and extending eastward through the whole of the Southern Oriental Region, including the Malay Archipelago; it is also extensively spread amongst the Pacific Islands, and as far south as Australia.

It is, however, difficult to assess the number of known "species" of *Melanitis*, owing to the very conflicting views of different authorities, and the empirical condition of our knowledge on that point. Forms which a few years ago were estimated as varieties only, have since, on further consideration by the same authors, been promoted to specific rank. Thus, in 1867, Mr. Butler published\* short diagnoses and references to forty-one different forms of *M. leda* contained in the British Museum, of which he summarised the habitats as "Java; Oceania; Australia; Africa," and stated that the variation was so gradual that it was impossible to determine the exact limits of the two extreme forms. In 1868† he formulated these into nine distinct varietal forms, but since that time has had reason to treat most, if not all, of these once-considered varieties as distinct species, in which he is in agreement with several modern authors.

The question, however, is far from solved, and the two species here included as such, in accordance with good authorities, have more often been considered as varietal forms, and should still be so if the following is accepted as conclusive.

Mr. Darwin, in discussing the variability and formation of the ocelli or egg-like spots on the plumage of birds, has made great use of these "varieties" of *M. leda*, from drawings made by Mr. Trimen and reproduced by him.‡ From an examination of the figures and a consideration of Mr. Trimen's remarks on the subject,§ Mr. Darwin states that "in some specimens large spaces on the upper surface of the wings are coloured black, and include irregular white marks; and from this state a complete gradation can be traced into a tolerably perfect ocellus, and this results from the contraction of the irregular blotches of colour. In

\* Ann. & Mag. Nat. Hist. ser. 3, vol. xix. p. 51 (1867).

† 'The Descent of Man,' ed. 2, pp. 428-9.

‡ Cat. Satyridæ, pp. 1-3.

§ Rhop. Afr. Austr. p. 186.

another series of specimens a gradation can be followed from excessively minute dots, surrounded by a scarcely visible black line, into perfectly symmetrical and large ocelli."

### 1. *Melanitis leda*. (Tab. IV., fig. 10.)

*Papilio Leda*, Linnaeus, Syst. Nat. i. 2, p. 773, n. 151 (1767); Drury, Ex. Ins. i. t. 15, f. 5, 6 (1773); Cram. Pap. Ex. iii. t. 196, C, D. (1780).

*Oreas (marmorata) Leda*, Hübner, Samml. exot. Schmett. (1806-1816).

*Melanitis Leda*, Fabr., Illiger's Mag. vi. p. 282 (1807); Moore (part). Cat. Lep. Mus. E. I. C. i. p. 222, n. 461 (1857); Butl., Cat. Satyr. p. 1, n. 1 (1868); Cat. Fabr. Lep. p. 9, n. 1 (part), (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 537, n. 1 (1877); Moore, Lep. Ceyl. i. p. 15, pl. 10, f. 1 *a, b* (1881).

*Hipio Leda*, Hübn., Verz. bek. Schmett. p. 56, n. 538 (1816).

*Satyrus Leda*, Godart, Enc. Méth. ix. p. 478, n. 4 (1823).

*Cylo leda*, Westw., Gen. Diurn. Lep. p. 361, n. 1 (1851); Butl., Ann. & Mag. Nat. Hist. ser. 3, vol. xix. p. 52 vars. 1, 2, 3, 3*b*, 4, 5 (1867); Snellen, Tijd. Ent. xix. p. 145, n. 9 (1876); *ibid.* xx. p. 66 (1877); *ibid.* xxi. p. 6, n. 17 (1878).

Male and female. Wings above fuliginous-brown. Anterior wings with a subapical blackish spot situated beyond end of cell, containing two whitish spots (one on each side of first median nervule), and bordered inwardly more or less distinctly with fulvous. Posterior wings with one, two, three, or even four submarginal black spots, with white centres and narrow pale margins, the largest of which is situated between second and third median nervules. Underside of wings varying from pale variegated lilaceous (as in specimen figured) to pale variegated ochraceous, covered with numerous darker strigæ. Anterior wings with three transverse dark fasciæ, the first and most indistinct crossing cell about one-third from base, the other passing through about centre of cell and the third a little beyond cell, and not quite reaching inner margin (these fasciæ are very inconstant, two being seen distinctly on specimen figured, but on some others they are barely distinguishable), and three, four, or five subapical black ocellated spots, with white centres and yellowish margins, situated between the nervules, of which the largest is placed between the first and second median nervules; in dark lilaceous specimens the space between the third median nervule and submedian nervure is more or less ochraceous. Posterior wings with a more or less distinct dark fascia, continuous with the centre one of anterior wings and not reaching abdominal margin, and with six submarginal ocellated spots, varying in size in different specimens, but the largest of which are the first and upper one, situated between, and sometimes extending beyond, the subcostal nervules, and the fifth, which is placed between the second and third median nervules; the last one is also sometimes duplex, as in the specimen figured. Body and legs more or less concolorous with wings.

In female specimens the spots on the upper surface of the wings are usually larger and brighter.

Exp. wings, ♂ 66 to 72 millim.; ♀ 77 to 84 millim.

HAB.—Continental India: Bombay (coll. Dist.); Central Provinces; Khasia Hills (coll. Moore).—Ceylon (coll. Moore, & Brit. Mus.)—Andaman Islands (Calcutta Mus.\* and coll. Moore).—Burma; Moulmein (Brit. Mus.)—Malay Peninsula; Penang; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.)—Sumatra (Snellen).—Java (coll. Moore and Brit. Mus.); Batavia (Snellen).—Borneo (coll. Godm. & Salv.)—Bali (coll. Moore).—Celebes (Snellen and Brit. Mus.)—Siam; Chentaboon (coll. Godm. & Salv.)—Formosa.—North China (coll. Moore).

This species varies in the shape of the anterior wings, sometimes having the apex distinctly falcate, as in the specimen figured, or indistinctly and scarcely recognisably so, as in a Bombay specimen in my own collection. As observed in Celebes it is crepuscular in habit, flying in the

\* Wood-Mason, Journ. Asiat. Soc. Beng. vol. L. p. 244 (1881).

evening at twilight, and also at early dawn.\* Mr. Trimen also records the crepuscular habits of this species (or a local form of it) at Mauritius, and states that there it could always be found "in the dark alleys between the rows of sugar-canes." † In Continental India, at Sangor, Capt. de la Chaumette describes this and an allied species as flying "at sunset under the Neem trees, resting for a long time motionless on the ground, and will not move until you almost tread upon them, when they will fly away in great haste and return to the same spot, chiefly some favourite stone." ‡ In North-Western India, according to Capt. Lang, these same species were found "always flitting about under the shade of trees or lurking in long grass." § In Ceylon Mr. Hutchison also describes its flight as taking place at dusk of evening and at dawn. ||

The larva (which I have figured at p. 37), was reared by Capt. Lang on "*Saccharum ravenne*."

## 2. *Melanitis ismene*. (Tab. IV., figs. 9, 11 & 12.)

*Papilio Ismene*, Cramer, Pap. Ex. i. t. 26, A, B (1775).

*Melanitis Banksia*, Moore, Cat. Lep. Mus. E. I. C. i. p. 222, n. 462 (1857).

*Cylo Leda*, Butl. (part), Ann. & Mag. Nat. Hist. ser. 3, vol. xix. p. 52 (1867).

*Melanitis Leda*, var. *Ismene*, Butl., Cat. Satyr. p. 2 (1868).

*Melanitis Ismene*, Moore, Proc. Zool. Soc. 1878, p. 824; Lep. Ceyl. i. p. 14, pl. 10, f. 2, *a, b* (1881); Wood-Mason & de Nicéville, Journ. Asiat. Soc. Beng. vol. L. p. 244, n. 8 (1881).

Male and female. Wings above either pale or dark fuliginous-brown. Anterior wings with the apical area darker, and possessing a subapical blackish spot, situated beyond end of cell, containing two whitish spots (one on each side of first median nervule), and bordered more or less distinctly above and inwardly with fulvous-red. Posterior wings with one, two, and sometimes three or four, very small submarginal white spots, with black margins; the most distinct of these spots is situated between the second and third median nervules, and the whole are sometimes practically obsolete as in the *var.* figured (fig. 11). Wings beneath variable in hue and markings, as follows:—

*Var. a, fig. 9* ♂. Dull greyish, with a lilaceous tinge, more or less irregularly spotted with fuscous, exhibiting on disk the broken remains of three dark fasciæ; anterior wings with a distinct white-centred spot between first and second median nervules, above which and first median nervule is a much more obsolete and indistinct spot; there are also indications of two apical spots situated on each side of upper disco-cellular nervule. Posterior wings with a more or less obsolete series of six submarginal ocellated spots, of which the first and upper, situate between the subcostal nervules, and the fifth, placed between second and third median nervules, are the largest and most distinct, being black with white centres and yellowish margins. This is the typical form of *Ismene* as figured by Cramer.

*Var. b, fig. 12* ♂. Wings much darker and more lilaceous, the fuscous markings absent; anterior wings with four distinct brownish fasciæ, three in and one just beyond end of cell, the first and second of which are continued on posterior wings, where they are curved, but do not reach abdominal margin. Both wings spotted as in *var. a*.

*Var. c, fig. 11* ♀. Wings pale ochraceous, the fasciæ, as seen in *var. b*, much fainter; anterior wings with the apical area paler and spots absent; posterior wings with the spots very faint or obsolete.

Body and legs more or less concolorous with wings.

Female. Larger, with the general colour both above and beneath brighter, and the subapical markings to the anterior wings above much more distinct and vivid.

Exp. wings, ♂ 70 to 72 millim.; ♀ 78 to 82 millim.

\* M. C. Piepers, Tijd. Ent. xix. pp. xviii. to xxiv. and English translation by Kirby, 'Entomologist,' x. p. 267; Snellen, Tijd. Ent. xix. p. 145.

† Trans. Ent. Soc. ser. 3, vol. v. p. 336.

‡ Ent. Mo. Mag. vol. ii. p. 37.

§ Ent. Mo. Mag. vol. i. p. 182.

|| Moore's Lep. Ceyl. i. p. 15.



HAB.—Continental India; Bombay (coll. Dist.), Neilgherries; Calcutta; Nepaul; Cashmere (coll. Moore).—Ceylon (coll. Moore).—Andaman Islands (Calcutta Mus.)—Burma; Moulmein.—Tenasserim (Limborg).—Malay Peninsula; Penang; Province Wellesley (coll. Dist.)—Sumatra.—Java.—Borneo (coll. Moore, Dist., and Brit. Mus.).

This is a very variable form beneath, but the three varieties described appear to represent the species in the Malay Peninsula. In other habitats different varieties are found.

The larva and pupa as found in Ceylon are described and figured in Moore's 'Lepidoptera of Ceylon,' from drawings made by the Bros. de Alwis. The shape is that of the larva of *M. leda*, the "head large, surmounted by two short pubescent red processes, last segment also with two processes; pale green with longitudinal rows of whitish dots; dorsal and lateral line darker green; head bluish, face striped with white and black. Pupa green, cylindrical; head and thorax obliquely flattened." \*

Its habits in Continental India were described with those of *M. leda* by Capt. Lang and Capt. de la Chaumette (*ante* p. 42); and, in the neighbourhood of Monghyr, Mr. Lockwood tells us that when "the toddymen cut the date trees," hundreds of this species "collect to feed upon the sweet sap, in company with many yellow-banded wasps and ants." †

#### Genus LETHE.

*Lethe*, Hübner, Verz. bek. Schmett. p. 56 (1816); Moore, Lep. Ceyl. i. p. 16 (1881).

*Debis*, Westw., Gen. Diurn. Lep. p. 358 (1851).

Anterior wings short and broad, with the costa strongly arched and apically convex, and the apex rounded; outer margin slightly waved and concave; inner margin straight; costal nervure dilated at base; first and second subcostal nervules emitted before the end of cell; upper disco-cellular nervule short, directed outwardly at base and then somewhat concavely bent and directed outwardly along its greatest length; lower disco-cellular nervule nearly straight and directed outwardly. Posterior wings irregularly subovate, with the outer margin waved and produced into an obtuse angle or tail near first median nervule; first and second median nervules with a common origin about apex of cell; disco-cellular nervules about or almost subequal in length. Eyes prominent and hairy. Palpi clothed beneath with fine long semi-erect hairs, distinctly separated—setose. Antennæ more or less incrassated at apex.

Above forty species of this genus have been described. It is strongly represented in Continental India, is not uncommon in the true Malayan Region, and is found as far north as China and Japan.

Only one species has at present been received from the Malay Peninsula, and is here alone included.

#### 1. *Lethe europa*. (Tab. V., fig. 5 ♂, 6 ♀.)

*Papilio Europa*, Fabricius, Syst. Ent. p. 500, n. 247 (1775).

*Oreas marmorea Europa*, Hübn., Samml. exot. Schmett. (1806—1816).

*Lethe Europa*, Hübn., Verz. bek. Schmett. p. 56, n. 534 (1816); Butl., Cat. Satyr. p. 114, n. 2 (1868); Cat. Fabr., Lepid. p. 29, n. 2 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 537, n. 1 (1877); Moore, Proc. Zool. Soc. 1877, p. 582; Wood-Mason & de Nicéville, Journ. Asiat. Soc. Bengl. vol. xlix. p. 226, n. 5 (1880).

\* Lep. Ceylon, i. p. 14.

† Nat. Hist. Sport and Travel, p. 226.

*Satyrus Europa*, Godart, Enc. Méth. ix. p. 478, n. 6 (1823).

*Debis Europa*, Westw., Gen. Diurn. Lep. p. 359, n. 1 (1851); Hewits., Journ. Linn. Soc., Zool. vol. viii. p. 143 (1865); Snellen, Tijd. Ent. xx. p. 66 (1877).

*Papilio Beroë*, Cram., Pap. Ex. i. t. 79, C, D (1779).

*Papilio Arete*, Cram., Pap. Ex. iv. t. 313, E, F (1782).

*Lethe Arcuata*, Butl., Cat. Satyr. p. 114, n. 4. t. 2, f. 3 (1868).

Male. Wings above fuliginous-brown. Anterior wings with a very indistinct transverse pale fascia across centre of cell (this is frequently quite obsolete), and with an oblique, broader, more distinct, and paler fascia just beyond end of cell, commencing on costa, where it is broadest, and terminating about third median nervule, where it is narrowest; two obscure whitish spots near apex, the upper one more or less duplex and situated at about base of fourth and fifth subcostal nervules; and with a submarginal pale waved line at outer margin, the fringe of which is also greyish. Posterior wings with a few submarginal and irregular darker spots, which are most distinct near apex, and with a pale submarginal waved line, which is inwardly and irregularly bordered with very dark brown. Wings beneath dark shining brown. Anterior wings with a narrow white fascia crossing the cell about centre and extending to about inner margin; an oblique, wider and more ochraceous fascia beyond end of cell, commencing at costa and terminating at about third median nervule, where it becomes fused in a waved series of six continuous, amalgamated spots, which extend from near costa to inner margin, and are lilaceous, with their centres fuscous and their inner and outer margins pale ochraceous; between these spots and the outer margin, which has a paler narrow submarginal band outwardly bordered with black, the ground colour becomes more ochraceous. Posterior wings with a narrow white fascia commencing at costa, a little distance from base, and terminating a little before centre of abdominal margin; a submarginal series of six large, subovate, continuous, amalgamated spots, which are pale brownish, and have the outer and inner margins lilaceous; the first and largest is situate on the two subcostal nervules, and has a large and rounded black centre, dusted with a few white spots; the remaining five are more elongated and compressed, fused together at the nervules, and have the centres more or less irregularly black, dusted with white, the sixth terminating at submedian nervure; posterior margin ochraceous, with a pale narrow submarginal band, bordered outwardly with black. Body, antennæ, and legs fuliginous-brown.

Female. Larger than the male. Anterior wings above with the oblique fascia at end of cell white, very broad, and terminating a little below third median nervule, followed by a white spot at posterior angle, the apical spots white and three in number, the upper two close together on each side of fifth subcostal nervule, the lower one distinctly preceded by the upper of two fuscous spots, situate one on each side of lower disco-cellular nervule, both being margined with paler brown. Posterior wings above as in male. Anterior wings beneath with the broad white fascia as above, which obliterates the fifth and part of the sixth submarginal spots, which are all paler and brighter than in the other sex. Posterior wings beneath as in male, but with all the markings larger and brighter.

Exp. wings, ♂ 65 to 70 millim.; ♀ 75 millim.

HAБ.—Continental India; Neilgherries; Malabar; Khasia Hills (coll. Moore); Bombay (coll. Dist.); Silhet (Brit. Mus.)—Andaman Islands (Calcutta Mus.)—Burma (coll. Moore).—Malay Peninsula; Penang (coll. Dist. and Brit. Mus.); Province Wellesley (coll. Dist.); Malacca (Brit. Mus.)—Sumatra (Snellen).—Java (Brit. Mus.)—Celebes (Snellen).—Siam (Mouhot).—China: Hong Kong (Brit. Mus.); Formosa; Hainan (coll. Moore).

The habits of this species appear to be much the same as those of *Mel. leda*. Mr. Bigg, at Penang, describes the “*Lethes*” (he refers to *L. beroë* and *L. arcuata* as two species) as “appearing in the padi-fields and ditches, especially at dusk”;\* and in Celebes, Piepers saw it

\* Month. Packet, vol. ii. p. 191 (1881).

flying in the morning twilight.\* As observed in North-Western India by Capt. Lang, it was found on grassy slopes in the shade or near hedges, "constantly pitching under bushes or at roots of trees, and lying *perdue*." †

### Genus CÆLITES.

*Cælités*, Westwood, Gen. Diurn. Lep. p. 367 (1851).

Anterior wings long and subtriangular, with the costa more or less notched at base and slightly arched, the apex depressed and rounded; outer margin slightly emarginate and scalloped, sometimes somewhat concave about centre; inner margin but very slightly dilated and nearly straight; costal nervure strongly dilated at base; first and second subcostal nervules emitted before the end of cell; upper disco-cellular nervule very much shorter than the lower one, which is more or less concave. Posterior wings more or less ovate, with the outer margin very slightly waved (as in *C. notlis*) or distinctly waved and obtusely angulated or tailed near first median nervule (as in *C. euptychioides*); first and second median nervules emitted close together about apex of cell; upper disco-cellular nervule short and curved; lower one longest and more or less oblique. Eyes naked. Antennæ very slender, the apical portion gradually and slightly thickened.

This is a genus of small extent, and apparently confined to Continental India and the true Malayan Region. Five species have been described, but it is possible, when due allowance has been made for local variation, that not more than three are really known to Science at the present time.

I have neither seen nor received any species of *Cælités* myself from the Malay Peninsula, but in 1867 Mr. Butler described and figured a specimen, which was collected in Malacca by Lieut. Roberts. As the type is in the collection of that gentleman, who, I am informed, is now absent from England, I have simply reproduced Butler's figures and description here. ‡

#### 1. *Cælités euptychioides*, var. *humilis*. (Fig. 15.)

*Cælités euptychioides*, Felder, Reise Nov. Lep. iii. p. 499, n. 865 (1866).

*Cælités Humilis*, Butler, Ann. Nat. Hist. ser. 3, vol. xx. p. 403, t. 8, f. 8; t. 9, f. 2 (1867).

*Cælités euptychioides*, var. *humilis*, Butl., Cat. Satyr. p. 112, n. 4 (1868).

Female. Wings above fuscous; external area of the anterior wings somewhat more obscure, of the posterior wings paler; both wings with an obscure marginal line. Posterior wings with a subanal and very indistinct blind "ocellus," margined with pale ochraceous; internal margin paler; body above fuscous; antennæ ferruginous.

Wings beneath paler and ochraceous; a medial fascia and another submarginal one on which the "ocelli" are generally distributed, violaceous; a discal clouded fascia, fuscous; two irregular marginal lines

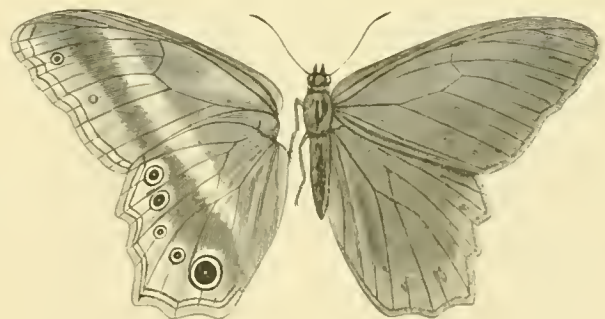


FIG. 15.

\* Tijds. Ent. xix. pp. xviii. to xxiv., and Eng. Trans. by Kirby, 'Entomologist,' x. p. 271.

† Ent. Mo. Mag. vol. i. p. 181.

‡ The original diagnosis is in Latin, but for the sake of uniformity I have given a more or less literal translation of the same.

distinctly fuscous; anterior wings with a small subapical ocellus; posterior wings with five "ocelli," the third and fourth smallest and the fifth largest; all of these are black, surrounded with fulvous, the outer margin of which is fuscous, and with very small white pupils. Body beneath ochraceous.

Exp. wings,  $3\frac{1}{8}$  in.

HAB.—Malay Peninsula; Malacca.—Ayerpanas (coll. Roberts).

I have followed Mr. Butler in considering his *C. humilis* as but a local form or *var.* of *C. euptychioides*, Feld., and Mr. Kirby\* considers it but a synonym of that species. Felder's typical *C. Euptychioides* was from Borneo, and Bornean specimens are contained in the British Museum. It has also been recently recorded from Sumatra. †

### Genus ERITES.

*Satyrus*, subg. *Erites*, Westwood, Gen. Diurn. Lep. p. 392 (1851).

Anterior wings somewhat elongate and narrow, with the costa arched and slightly convex at its apex, the apex rounded; outer margin nearly straight, or very slightly waved inwardly about middle; inner margin nearly straight; costal nervure very strongly dilated at base; first and second subcostal nervules emitted before the end of cell; upper disco-cellular nervule very short, directed a little outwardly at base, and then somewhat concavely in its greater length to apex; lower disco-cellular nearly straight, and very slightly directed either outwardly or inwardly. Posterior wings irregularly subovate, with the outer margin waved and produced into an obtuse angle or tail near first median nervule; nervules well separated at their origin; disco-cellular nervules about or almost subequal in length, the upper one concave, the lower one almost straight. Eyes prominent and naked. Palpi clothed beneath with fine long semi-erect hairs, somewhat separated and placed in tufts. Antennæ slender, the apical portion slightly and gradually thickened.

Four species represent our present knowledge of this genus, and its distribution is limited. We have no record of its having been discovered in Continental India; one species is apparently confined to the Malay Peninsula, extending, however, as far north as Upper Tenasserim; two have been received from Borneo, and another is found in Java.

#### 1. *Erites angularis*. (Tab. V., fig. 3.)

*Erites angularis*, Moore, Proc. Zool. Soc. 1878, p. 825.

Male. Wings above semihyaline, pale smoky ochraceous, the basal halves mottled with narrow, darker strigæ. Anterior wings crossed by two dark oblique fasciæ, the first of which is nearly straight and passes from costal nervure through apical angle of cell to about middle of submedian nervure; the second commences about the bases of fourth and fifth subcostal nervules, touches cell at its lower apex, and is then distinctly bent inwardly and terminates on submedian nervure; three very obscure subapical ocellated spots, divided by the discoidal nervules, with extremely faint and minute white centres, margined outwardly with ochraceous, and with the extreme margin pale fuscous; a very large ocellated spot situated on second and third median nervules, with a whitish centre and ochraceous margin, which is widest outwardly, and there and above also margined with fuscous; and with two waved fuscous marginal lines, the inner one becoming somewhat obsolete towards posterior angle; the marginal fringe also fuscous. Posterior wings crossed by two very angulated dull ochraceous fasciæ, of which the margins are somewhat fuscous; the inner commencing at costa in a line with the corresponding one of anterior wing, curved and

\* Cat. Diurn. Lep. p. 45, 3 (1871).

† Smith, in Boeck, 'Head Hunters of Borneo,' Append. V.

angularly dentated in cell, and from thence transversely directed to about middle of abdominal margin; outer fascia much waved, dentated inwardly near base of disco-cellular nervule, and more strongly and less regularly outwardly on first median nervule, from thence transversely concave to abdominal margin; a submarginal series of five ocellated spots, of which the fourth and fifth are largest and brightest, and situate between the median nervules; the upper three smaller, much more indistinct and situate between the nervules; these spots are fuscous, with a yellowish rim and fuscous margin; and two waved yellowish marginal lines, bordered outwardly and inwardly with fuscous. Underside of wings somewhat paler and more violaceous, but with the markings brighter and more distinct; the large ocellated spot to anterior wing with a large silvery centre and its margin pale yellowish. Posterior wings with the two discal fasciæ much more brightly ochraceous, the outer one becoming somewhat fused with the central spots, and its outer margin only bordered distinctly with fuscous at abdominal margin; spots with distinct pale centres; the third and fourth smallest and very widely margined with ochraceous. Body above pale fuscous; abdomen ochraceous beneath; legs pale ochraceous.

Exp. wings 55 millim.

HAB.—Tenasserim (colls. Moore, Wood-Mason, and Brit. Mus.)—Malay Peninsula; Perak (coll. Godm. & Salv.)

The specimen figured was collected by Dr. Townsend in Perak, and is to the present time the only one I have seen from this district. This species is very distinct, differing from the other three with which we are at present alone acquainted by the more apically produced anterior wings, and by the inner fascia of the posterior wings being acutely dentate at its centre; it also structurally differs in having the lower disco-cellular nervule of the anterior wing slightly directed inwardly.

#### Genus MYCALESIS.

*Mycalesis*, Hübner, Verz. bek. Schmett. p. 54 (1816); Westw., Gen. Diurn. Lep. p. 392 (1851); Trimen, Rhop. Afr. Austr. p. 206 (1866).

Wings short and broad. Anterior wings with the costa strongly arched and with the apex rounded; the outer margin generally slightly convex; inner margin slightly dilated, especially in the males. Costal nervure and sometimes also median and submedian nervures swollen at base; first and second subcostal nervules emitted before end of cell; lower disco-cellular nervule much longer than the upper. Posterior wings ovate, with the outer margin sometimes more or less waved; first and second median nervules either emitted close together at end of cell, or with their bases approximating, but distinctly separated; disco-cellular nervules more or less transversely closing cell. Males provided with one or sometimes two pseudo scent-glands covered by tufts of hair to posterior wings, and sometimes with one of the same to anterior wings.

The distribution of this very extensive genus extends over a wide area. It is not found in either America or Europe, but is abundant in Africa, is found in Madagascar and the neighbouring islands, and is very extensively represented in Tropical Asia, and on that continent is found as far north as China. It also occurs throughout the length and breadth of the Malayan Archipelago, including Papua, and from thence south to Australia. Of these Eastern species (excluding Africa), "hitherto described under the genus *Mycalesis*," Mr. Moore, in a recent revision,\* has enumerated eighty-six species, which he has arranged in twenty-three genera,

\* Trans. Ent. Soc. 1880, p. 155.

twenty-one of which are there described for the first time. I am considerably indebted to these for the characters which I have here used as sectionally dividing the species of *Mycalesis* found in the Malay Peninsula.

As in the genera *Danaïs* and *Euploa*, the males (as Mr. Moore has pointed out) are provided with a glandular pouch (probably a scent-secreting organ\*), covered by a tuft (or tufts) of hair, which is either in some species found on both wings, or in others on the posterior wings only. In Java a species possesses two of these appendages to the posterior wings, but according to our present knowledge no species in this fauna possesses more than one.

I have here included seven species, which account for all that have been referred to from this region by other writers, though in some cases I have formed conclusions as to specific value which are not in unison with those of some authorities. In all cases, however, I have endeavoured to show where and why this divergence of opinion takes place.

A. *Males possessing a pseudo scent-gland on both anterior and posterior wings.*

1. *Mycalesis maianeas*. (Tab. VII., fig. 4 ♀.)

*Mycalesis Maianeas*, Hewitson, Exot. Butt. iii. p. 87; *Myc.* t. 5, f. 27, 28 (1864); Butl., Cat. Satyr. p. 131, n. 18 (1868).

*Satoua Maianeas*, Moore, Trans. Ent. Soc. 1880, p. 157.

As I have not received this undoubted Malaccan species, I have here reproduced Hewitson's figure, and add the description of that author:—

“Upper side. Male dark brown; the outer half nearly of the anterior wing, and the outer margin of the posterior wing, rufous-brown. Anterior wing with a tuft of hair near the inner margin: the margins of both wings where they meet silvery white.

“Under side dark brown to the middle, rufous-brown beyond; the outer margin and two submarginal lines dark brown. Anterior wing with three ocelli, two near the apex minute and touching, the third below the middle, large; posterior wing with seven, the first (touching the costal margin), the fourth and fifth large, the rest smaller, all black, with pupil white, and iris rufous-orange.”

“Female like the male, except that it has an orange band on both sides of the anterior wing, and has but one ocellus, near the apex, on the underside of the anterior wing.”

Exp. wings, ♂  $1\frac{1}{10}$  in.; † ♀  $2\frac{2}{10}$  in. †

HAB.—Malay Peninsula: Malacca (coll. Hewits.)—Sumatra. §—Borneo: Sarawak (coll. Hewits.).

This species is peculiar in having, by its superficial characters, at least, a strong affinity with the species of an African group of the genus. Mr. Moore has proposed a new genus (*Satou*) for its reception.

NOTE.—In faithfully reproducing Hewitson's figure, our artist, Mr. H. Knight, must not be held responsible for the imperfect neuration of the same.

\* As with the genus *Euploa*, I have used the term “pseudo scent-gland,” because, though the probability of these being scent-producing or scent-secreting organs, as in the genus *Danaïs*, is eminently and distinctly probable, still the evidence in its favour, unlike that of *Danaïs*, requires local verification.

† 48 millim.

‡ 55 millim.

§ Smith, in Bock, ‘Head Hunters of Borneo,’ Append. V.

a. *Costal, median, and submedian nervures dilated at base.*2. *Mycalesis orseis*. (Tab. V., fig. 4.)

*Mycalesis Orseis*, Hewitson, Exot. Butt. iii. p. 89; *Myc.* t. 6, f. 36, 37 (1864); Butl., Cat. Satyr. p. 136, n. 35 (1868); Druce, Proc. Zool. Soc. 1873, p. 339, n. 1.

*Suralaya Orseis*, Moore, Trans. Ent. Soc. 1880, p. 159.

Male. Wings above brown, strongly suffused with bright violaceous. Anterior wings with about apical third paler, on which are three obscure ocellated spots, the upper two smallest and situate on each side of upper discoidal nervules, the third and largest between second and third median nervules, and with two obscure dark marginal lines. Posterior wings much paler towards apical margin, with two dark marginal lines, and with a submarginal waved, narrow, dark fascia. Wings beneath pale ochraceous, both wings crossed by a very broad, slightly darker fascia, the margins of which are pale fuscous; on anterior wings its outer margin is at some little distance beyond end of cell, and on posterior wings it passes about apex of cell; beyond this fascia the colour is paler and tinged with violaceous. Anterior wings with a submarginal series of five ocellated spots, black with white centres and yellowish margins, surrounded with pale fuscous, of which the third and fourth are smallest and the fifth largest (sometimes the upper four are of equal size); these spots are placed between the nervules, the first above upper discoidal nervule, and the fifth between second and third median nervules; a sixth very small and obscure spot is sometimes found beneath the third median nervule; a strongly waved, narrow, pale fuscous submarginal fascia, and two fuscous marginal lines. Posterior wings with seven ocellated spots similar to those of anterior wings, of which the second, third and fourth are smallest, and the fifth largest, as in the specimen figured, but the upper four are variable in size; these, with the exception of the last, are all placed between the nervules, the first between the subcostal nervules, and the seventh on submedian nervule; a narrow submarginal fascia and two marginal lines as on anterior wing. Body and legs more or less concolorous with wings.

Male possessing a long tuft of dark hairs at subcostal base of posterior wings, and with an indistinct glandular patch covered with short hairs about centre of submedian nervule of anterior wings, obscure above but distinct beneath.

Exp. wings, 50 millim.

HAB.—Malay Peninsula; Singapore (Kirby\*).—Sumatra (coll. Hewits.)—Borneo (colls. Moore and Godm. & Salv.)

This species appears to possess the usual variation in macular markings, and is included among the butterflies of this fauna, on the authority of the Singapore specimen in the Hewitsonian collection. I have not seen it myself in any other collection from the Malay Peninsula, nor have I been able to examine a female specimen.

aa. *Costal nervure only dilated at base.*3. *Mycalesis medus*. (Tab. IV., fig. 8.)

*Papilio medus*, Fabricius, Syst. Ent. p. 488, n. 198 (1775).

*Papilio Hesionæ*, Cram. Pap. Exot. i. t. 11, C, D (1775).

*Mycalesis hesione*, Hübn., Verz. bek. Schmett. p. 55 (1816); Hewits., Journ. Linn. Soc., Zool. vol. viii. p. 146 (1865); Butl., Cat. Satyr. p. 138 n. 50 (1868); Cat. Fabr. Lep. p. 34, n. 11 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 537, n. 4 (1877); Snellen, Tijd. Ent. xx. p. 66 (1877).

*Orsotriana Hesionæ*, Wallengr., Kongl. Vet. Akad. Förh. xv. p. 80 (1858); Moore, Trans. Ent. Soc. 1880, p. 160.

\* 'Cat. Diurn. Lep. formed by W. C. Hewitson,' p. 123 (1879).

*Papilio Doris*, Cram. Pap. Exot. iv. t. 362, C (1782).

*Papilio Hamilcar*, Herbst, Natur. Schmett. viii. p. 73, t. 193, f. 3 (1796).

*Mycalesis cinerea*, Butl. Ann. Nat. Hist. ser. 3, vol. xx. p. 401, t. 8, f. 9 (1867); Cat. Satyr. p. 138, n. 49 (1868).

*Mycalesis (Orsotriana) medus*, Wood-Mason and de Nicéville, Journ. A. S. Beng. vol. L. p. 230, n. 11 (1881).

Male. Wings above fuliginous-brown, with a narrow, obscure, paler fascia crossing both wings beyond cells, but nearer the apex of cell of posterior than that of anterior wings. Wings beneath fuliginous-brown, crossed by a narrow pale white fascia, commencing near costa between upper apical angle of cell and apex of anterior wings where it is narrowest, and terminating a little before anal angle of posterior wings. Anterior wings with two large submarginal ocellated spots, black with white centres, margined respectively with ochraceous and fuscous, with an extreme outer border of pearly grey, the first and smallest of which is situate on the discoidal nervules, and the lower and largest on the second and third median nervules. Posterior wings with three submarginal ocellated spots of the form and colour of those of anterior wings, the first and smallest of which is placed between the subcostal nervules, contiguous to the second and much larger spot, and both enclosed by one outer pearly grey margin (in some specimens each has a separate pearly outer margin); third and largest spot on second and third median nervules; both wings possessing two narrow pale waved marginal lines, those of the posterior wings much more distinct. Body and legs concolorous with wings.

Male with a tuft of long hairs, covering the base of a glandular pouch, situate between and near the bases of third median nervule and submedian nervule, and with a tuft of long hairs near base of median nervule of posterior wings.

Exp. wings, ♂ 42 to 49 millim.; ♀ (one spec.) 57 millim.

HAB.—Continental India; Gangetic Plains (coll. Moore); Silhet (Brit. Mus.)—Ceylon? \* (coll. Dist.)—Nicobar Islands.—Brit. Burma (coll. Moore).—Malay Peninsula; Penang; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.)—Singapore (coll. Moore).—Sumatra (Snellen).—Java (Brit. Mus.)—Borneo (coll. Godm. & Salv.)—Celebes (Snellen); Macassar: Flores; Timor (coll. Moore).—Gilolo (coll. Dist.).

A male specimen is here figured. As with other species of the genus, considerable variation ensues in the size of the ocellated spots on the under surface of the wings.

B. *Males possessing a pseudo scent-gland on posterior wings only.*

b. *Costal, median, and submedian nervures dilated at base.*

c. *Males with a single tuft of hairs at subcostal base of posterior wings.*

#### 4. *Mycalesis mineus*. (Tab. IV., fig. 13 ♂, 14 ♀.)

*Papilio Mineus*, Linnæus, Syst. Nat. i. 11, p. 768, n. 126 (1767); Fabr., Syst. Ent. p. 488, n. 197 (1775).

*Papilio Justina*, Cram., Pap. Exot. iv. t. 323, C (1782).

*Mycalesis Justina*, Hübn., Verz. bek. Schmett. p. 55, n. 524 (1816); Snellen, Tijd. Ent. vol. xix. p. 145, n. 9 (1876); *ib.* vol. xx. p. 66 (1877).

*Satyrus Mineus*, Godt., Enc. Méth. ix. p. 510, n. 97 (1823).

*Mycalesis Mineus*, Butl., Cat. Satyr. p. 135, n. 31 (1868); Cat. Fabr. Lep. p. 834, n. 8 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 537, n. 1 (1877); Moore, Proc. Zool. Soc. 1878, p. 825; Wood-Mason and de Nicéville, Journ. A. S. Beng. vol. xlix. p. 226, n. 7 (1880).

*Calysime Justina*, Moore, Trans. Ent. Soc. 1880, p. 161.

*Calysime mineus*, Moore, Trans. Ent. Soc. 1880, p. 162; Lep. Ceyl., p. 22, t. 11, f. 4, a, b (1881).

\* I have an undoubted specimen of this species labelled "Ceylon," which is my reason for giving that habitat. Mr. Moore, however, has not included it in his 'Lepidoptera of Ceylon,' but only an allied species. I have therefore felt a little doubt as to whether I really possess a Ceylon specimen.



Male. Wings above fuliginous-brown. Anterior wings with a faint, pale, straight fascia, which passes a little beyond end of cell, and from which to outer margin the colour is slightly paler; a black spot with a white centre and a faint ochraceous margin between first and second median nervules, and two marginal fuscous lines, the innermost of which becomes faint and obsolete towards apex; fringe smoky ochraceous. Posterior wings with two distinct marginal lines, on each side of which the colour is dull ochraceous (in some specimens a minute white-centred fuscous spot between second and third median nervules). Wings beneath with the colour brighter and paler; both wings crossed by a narrow fascia, on anterior wings passing somewhat beyond, and on posterior wings about end of cell: anterior wings with two submarginal ocellated spots, which are black, with white centres and yellow margins, the first and smallest situate on the discoidal nervules, and perfectly surrounded by a pale greyish line, the second and largest placed on the second and third median nervules, with a pale surrounding greyish line, which terminates inwardly on the transverse white fascia (both these spots sometimes throw off a smaller one, the upper one generally posteriorly and the lower one usually anteriorly, as shown in the female figure here given); two pale greyish marginal lines, the inner one waved, and the fringe also pale greyish. Posterior wings with seven submarginal ocellated spots of a similar pattern and colour to those on anterior wings, of which the second and third are minute, the whole series being surrounded by a much waved pale greyish fascia, which in some specimens tends to coalesce and perfectly surround the sixth and seventh spots; two pale greyish marginal fasciæ, the inner one most strongly waved, and the marginal fringe also pale greyish. Body and legs concolorous with wings.

Male with a tuft of long pale hairs situate near costal base of posterior wings.

Female. Larger than male; anterior wings above with the ocellated spot larger and brighter; posterior wings above with two more obscure ocellated spots situate on the second and third median nervules (there are sometimes indications of the commencement of a third spot between the third median nervule and submedian nervure). Wings beneath as in male, but with all the spots and markings larger and brighter.

Exp. wings, ♂ 42 to 45 millim.; ♀ 60 millim.

Var. *a.* *Mycodesis cepheus*, Butl., Ann. & Mag. Nat. Hist. xx. p. 402, pl. 9, f. 3, 4 (1867); Cat. Satyr. p. 134, n. 30 (1868).

*Mycodesis blasius*, var. *Cepheus*, Kirby, Syn. Cat. Diurn. Lep. pp. 89, 90, n. 29 (1871).

*Calysime Cepheus*, Moore, Trans. Ent. Soc. 1880, p. 163.

Male. This variety differs on the underside of the anterior wing in having an additional spot in front of lower ocellated spot, and enclosed by the same pale greyish line; and on the underside of the posterior wings in having the second and third submarginal spots a little longer, which render the series apparently a little more arched, as Butler describes.\*

This specimen was collected in Penang by Lieut. Roberts.

Var. *b.* (Tab. IV., fig. 7.)

Male. Differs from typical specimens on the underside of the wings by the lower ocellated spot of the anterior wing having a smaller one attached or non-attached to it beneath, but which is also enclosed by

\* I am possibly in agreement with Mr. Butler in estimating his *M. cepheus* as but a varietal form of *M. mineus*, as in his "Tabular View of the Butterflies of Malacca" (Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 564, 1877) he does not enumerate it, though he includes others which were not collected by Capt. Pinwill. That writer correctly remarked in his description that it was allied to *M. mineus*, and I cannot agree with Mr. Kirby in considering it as a variety of *M. blasius*. Mr. Butler has also included *M. polydecta* in his Malaccan species. The form he has figured (Ann. & Mag. Nat. Hist. ser. 3, vol. xx. pl. ix. f. 5 & 6), however, does not agree with Cramer's figure of that species, and from an examination of the Malaccan specimens thus identified in the British Museum I certainly incline to the opinion that such are but varieties of *M. mineus*, and that the true *M. polydecta*, Cram., cannot as such be at present included in this fauna.

the same surrounding pale greyish line: \* posterior wings with the second and third small ocellated spots of typical specimens totally absent. (In the figure here given the seventh and smallest spot has been omitted.)

This variety I have received from Province Wellesley.

HAB.—Continental India; Bombay (colls. Moore & Dist.); Silhet (Brit. Mus.)—Ceylon (coll. Moore).—Andaman Islands (Calcutta Mus.)—Tenasserim (Limborg).—Malay Peninsula; Penang; Province Wellesley (coll. Dist.); Malacca (Brit. Mus. and coll. Godm. & Salv.)—Sumatra (Snellen).—Java (coll. Moore).—China; Hong Kong (colls. Moore and Brit. Mus.).

I have compared the two specimens figured (Tab. IV., figs. 13, 14) with the Linnean typical specimens in the possession of the Linnean Society of London, and have satisfied myself as to their identity. This is a very variable species, but not more so than we might expect, when we remember analogous cases of Satyrid variation in Europe. Even in England *Hipparchia hyperanthus* affords a good example, and an inspection of the figures of the six varieties of that species, as given by Mr. Newman, † will convince any one of the little specific value afforded by either the size or number of these ocellated spots in that species. Had a Malayan descriptive entomologist been dealing with these British varieties, as occasionally received by him, there is little doubt that some at least of them would have been described as distinct species. In my opinion the operation has only been reversed with respect to *M. mineus*, and this must frequently occur with us all when describing unique specimens from abroad. It is only when many specimens are accumulated that the strength of this varietal view of the value of ocellated spots can be fully apprehended, as has been abundantly shown in the American genus *Euptychia* by Messrs. Godman and Salvin, ‡ and as Mr. Darwin had taught us to expect. § Linnaeus himself can also be adduced as a witness to the varietal character of his species. Dr. Aurivillius, of Stockholm, has very kindly forwarded me a coloured copy of a figure in the unpublished 'Icones' of Clerck, below which, as Dr. Aurivillius informs me, "Linné himself has written '84 Mineus,' and which therefore may be relied on as typical." This figure apparently represents an extreme variety (female), in which the ocellated spots of the underside of the wings are very small, and the area in which they are placed very pale.

##### 5. *Mycalesis blasius*. (Tab. VII., fig. 7.)

*Papilio Blasius*, Fabricius, Ent. Syst., Suppl. p. 426, n. 488–489 (1798).

*Mycalesis Blasius*, Butl., Proc. Zool. Soc. 1867, p. 720, fig. 4; Cat. Satyr. p. 137, n. 40 (1868); Cat. Fabr. Lep. p. 34, n. 10 (1869); Moore, Proc. Zool. Soc. 1878, p. 825.

*Mycalesis lurida*, Butl., Trans. Ent. Soc. 1879, p. 3.

*Calysime Blasius*, Moore, Trans. Ent. Soc. 1880, p. 162; Lep. Ceyl. i. p. 21, t. xi. f. 2, 2a (1881).

Male. Wings above fuliginous-brown; in some specimens the anterior wings have a small obscure white-centred spot near bases of fourth and fifth subcostal nervules. Wings beneath fuliginous-brown; both wings crossed by a narrow, pale, whitish fascia, which passes a little beyond the apices of the discoidal cells. Anterior wings with four submarginal ocellated spots, black with white centres and ochraceous

\* Mr. Moore (Lep. Ceyl. i. p. 22) describes a like varietal form as not uncommon in Ceylon, and which is indicated in his figure, Plate XI., f. 4b.

† 'British Butterflies,' p. 95.

‡ Biol. Centr. Am. Rhop. p. 87.

§ 'Descent of Man,' ed. 2, p. 427 *et seq.*

margins placed between the nervules; of these the second and third are smallest and obscure, and the fourth, situate between the second and third median nervules, largest; the first or upper one is placed between the discoidal nervules; two marginal waved pale lines. Posterior wings with seven submarginal ocellated spots similar to those of anterior wings, and which, with the exception of the sixth and seventh, are placed between the nervules, and are all encircled by a narrow pale greyish fascia; of these the second and third are smallest, the first is situate between the subcostal nervules, and the sixth and seventh are placed between the third median nervule and submedian nervure; two marginal, waved, pale greyish lines. Body and legs more or less concolorous with wings.

Male with a tuft of long pale hairs situate near costal base of posterior wings.

Exp. wings, 42 millim.

Var. *a.* *Mycalesis samba*, Moore, Cat. Lep. Mus. E. I. C. i. p. 233, n. 498 (1857).

*Mycalesis blasius*, var. *samba*, Butl., Cat. Satyr. p. 137, n. 40 (1868).

*Calysime samba*, Moore, Trans. Ent. Soc. 1880, p. 163.

This variety appears to differ chiefly in having but two ocellated spots on the under surface of anterior wings, and was described as from "N. India."

Var. *b.* *Mycalesis lalassis*, Hewitson, Ex. Butt. iii. p. 89; *Myc.* t. 6, f. 35 (1864).

*Mycalesis blasius*, var. *lalassis*, Butl., Cat. Satyr. p. 137, n. 40 (1868).

*Calysime lalassis*, Moore, Trans. Ent. Soc. 1880, p. 163.

This form differs, as Butler states, in having the "distinct subanal spot of the front wings above." Mr. Hewitson himself\* subsequently considered it as the equivalent of the *M. samba*, Moore, and in this view I agree. Hewitson's specimen was received from Gilolo.

HAB.—Continental India; Cachar (Brit. Mus.)—Ceylon (coll. Moore).—Burma; Pegu (coll. Moore).—Upper Tenasserim (Limborg).—Malay Peninsula: Perak (coll. Godm. & Salv.); Singapore (coll. Moore).—Java.—Philippines.—Formosa (coll. Moore).

This, like *M. mineus*, appears to be a protean species, though the differences are only what may be expected by those who take an evolutionary view of the origin of the ocellated spots, and consequent variability of the same. Mr. Butler† has inadvertently shown this variability, as in comparing the form *samba* with typical *blasius* he states that the Fabrician species has "three ocelli on the underside of the front wings," whilst, comparing it with the form *lalassis*, he states that *blasius* has but two.

I have not been able to examine a female specimen, which, however, Mr. Moore ‡ describes as being similar to the male.

The specimen figured was collected in Perak by Dr. Townsend.

## 6. *Mycalesis fusca*. (Tab. V., fig. 1 ♀.)

*Dasgomma fuscum*, Felder, Wien. Ent. Mon. iv. p. 401, n. 27 (1860).

*Mycalesis fuscum*, Butl., Cat. Satyr. p. 141, n. 79 (1868); Druce, Proc. Zool. Soc. 1873, p. 339, n. 7.

*Mycalesis fusca*, Butl., Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 537, n. 5 (1877).

*Mycalesis Diniche*, Hewits., Ex. Butt. iii. p. 85, *Myc.* t. 4, f. 23 (1862); Journ. Linn. Soc., Zool. vol. viii. p. 146 (1865).

*Mycalesis margites*, Hewits., Ex. Butt. v. *Myc.* t. 9, f. 59 (1874).

*Mydosama fuscum*, Moore, Trans. Ent. Soc. 1880, p. 170.

Male. Wings above fuliginous-brown. Anterior wings with an indistinct dark fascia, crossing them at end of cell, but not extending much beyond third median nervule; an ocellated spot, which is fuscous

\* Ex. Butt. vol. iii. p. iv.

† Cat. Satyr. p. 137.

‡ Lep. Ceyl. i. p. 21.

with an indistinct white centre and yellowish and fuscous margins, situate between second and third median nervules; a submarginal, narrow, waved, obscure fascia; and with two fuscous marginal lines, the inner one bordered on each side with ochraceous. Posterior wings with two submarginal ocellated spots, the first smallest, imperfect and obscure, between first and second median nervules; the second and largest between second and third median nervules; marginal markings as on anterior wings. Wings beneath ochraceous, both crossed by two pale reddish fasciæ, the first passing through the centres of both cells, the second a little beyond their apices. Anterior wings with four submarginal ocellated spots, brighter than those on upper surfaces, but marked and coloured in the same manner, the upper three smallest and placed close together, divided by the discoidal nervules; the fourth and largest situate on the second and third median nervules; a distinct, waved, narrow, fuscous submarginal fascia and two fuscous marginal lines. Posterior wings with a submarginal series of seven ocellated spots, margined inwardly with pale reddish, the first five placed singly between the nervules, the sixth and seventh close together between the third median nervule and the submedian nervure, and of which the fourth, fifth and sixth are largest; two fuscous marginal lines and a submarginal fuscous line, strongly waved near apex. Body and legs concolorous with wings. Antennæ ochraceous, the club dark fuscous near apex.

Male with a tuft of long pale hairs, covering a glandular pouch, near base of first subcostal nervule of posterior wings.

Female. Larger and brighter than male; posterior wings above with the outer margin broadly ochraceous, and with the seven ocellated spots of the under surface visible above, the first two very faintly, but the remaining five bright and distinct; on the anterior wings the three upper ocellated spots of the under surface are denoted by small, obscure, fuscous spots. Wings beneath generally as in male.

Exp. wings, ♂ 47 millim.; ♀ 53 millim.

HAB.—Malay Peninsula; Malacca (coll. Dist. and Brit. Mus.)—Singapore (Brit. Mus.)—Sumatra (coll. Moore).—Borneo (colls. Dist.; Godm. & Salv.).

This species is the type of the genus *Mydosama*, Moore, which that author has founded for a group of twenty species which are distributed over an area commencing in the Malay Peninsula, and extending throughout the Malayan Archipelago to Australia.

cc. *Males with a double tuft of hairs at subcostal base of posterior wings.*

### 7. *Mycalesis janardana*. (Tab. V., fig. 2.)

*Mycalesis Janardana*, Moore, Cat. Lep. Mus. E. I. C. i. p. 234 (1857); Butl., Cat. Satyr. p. 136. n. 37 (1868); Snellen, Tijds. Ent. xix. p. 146, n. 14 (1876); Butl., Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 537, n. 3 (1877).

*Martanda Janardana*, Moore, Trans. Ent. Soc. 1880, p. 169.

Wings above fuliginous-brown; apex and outer margin of anterior wings somewhat paler. Posterior wings with the apical half somewhat paler, and with two submarginal, small, obscure and impressed fuscous spots, placed one on each side of second median nervule. Both wings with two narrow fuscous marginal lines, the marginal fringe greyish. Underside of wings somewhat paler, but mottled with darker brown; both wings crossed by a narrow grey fascia, passing beyond end of cells, but not reaching costa of anterior wings nor anal angle of posterior wings. Anterior wings with a submarginal row of six ocellated spots, fuscous with faint whitish centres, and with ochraceous and fuscous margins, the extreme outer margin being obscure greyish; these are situate between the nervules, the first above the upper discoidal nervule, and the sixth beneath the third median nervule, the first being smallest and the fifth largest; the basal portion beneath cell is also pearly grey, and there are two fuscous marginal lines, the inner one being bounded on each side with dull ochraceous; marginal fringe pale greyish. Posterior wings with a submarginal row of seven spots of like pattern to those of anterior wing, the first five of which are

placed singly between the nervules, and the sixth and seventh together are situate between the third median nervule and submedian nervure, and are surrounded by one outer greyish margin; marginal lines and fringe as in anterior wings. Body and legs concolorous with wings; antennæ dull ochraceous, narrowly fuscous beneath; club brighter and paler, broadly black beneath near apex.

Male with two long tufts of pale hairs situate at subcostal base of posterior wings.

Exp. wings 44 millim.

HAB.—Malay Peninsula; Malacca (Brit. Mus.)—Java (colls. Moore and Snellen).—Sumatra (coll. Moore).

This species appears to have a somewhat restricted area of distribution. Mr. Butler has described and figured,\* under the name of *Mycalesis nautilus*, a form which he justly states is “closely allied to *M. janardana*.” This insect was taken in Malacca (where *M. janardana* is found) by Lieut. Roberts, in whose collection the type remains.

### Genus YPTHIMA.

*Ypthima*, Hübner, Verz. bek. Schmett. p. 63 (1816); Westw., Gen. Diurn. Lep. p. 394 (1851); Trimen, Rhop. Afr. Austr. p. 205 (1866); Moore, Lep. Ceyl. i. p. 24 (1881).

Wings short and broad. Anterior wings subtriangular, with the costa arched and the apex rounded; the outer margin entire and slightly convex; inner margin nearly straight; costal nervure strongly swollen at base; first subcostal nervule only emitted before end of cell; upper disco-cellular nervule angled inwardly near base, from thence concave, lower one also concave; median nervure slightly swollen at base. Posterior wings ovate, the costa strongly rounded and deflexed to apex, the outer margin entire; median nervules well separated at their bases, the first emitted from about end of cell; disco-cellular nervules oblique, slightly concave, the lower one longest.

This genus has a wide area of dispersal; it is found in Western, Southern, and Eastern Africa (as far north as Abyssinia), is represented in Madagascar, is not uncommon in Tropical Asia, and found on that continent as far north as Japan, distributed throughout the Malayan Archipelago, and extending to Australia. Our knowledge of the genus is slowly increasing. Prof. Westwood, in 1851,† could enumerate only ten species; in 1865 Mr. Hewitson‡ monographed the genus, and included twenty-four species therein; since that time many more have been described, and the present number of reputed species is little short of forty. We know little of their habits. According to Capt. Lang,§ the Himalayan species are “of very feeble flight, frequenting banks, hedges, and grassy land.” In Ceylon Mr. Hutchison|| describes one species as taken only in long grass on borders of coffee-plantations at an elevation of 3000 feet, and another as being very common among the roadside grasses and weeds, its flight short, “constantly settling down on leaves, or in grass.”

#### 1. *Ypthima corticaria*. (Tab. VI., fig. 8.)

*Ypthima corticaria*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 537, n. 3 (1877).

Male and female. Wings above fuliginous-brown. Anterior wings with a large subovate paler fascia, placed transversely on apical half, and on which is a large ocellated spot, which is black, with two inner

\* Ann. & Mag. Nat. Hist. xx. p. 402, pl. ix. f. 7 (1867).

† Trans. Ent. Soc. ser. 3, vol. ii. p. 283.

‡ Moore's Lep. Ceyl. i. pp. 24, 25.

§ Gen. Diurn. Lep. pp. 395, 396.

|| Proc. Zool. Soc. 1865, p. 502.

bluish white spots, and the outer margin ochraceous; this is also somewhat narrowly and obscurely outwardly fuscous; the spot is situate a little beyond end of cell, and rests on the two discoidal and the first median nervules; a submarginal waved fuscous fascia, and two marginal fuscous lines. Posterior wings with a broad paler submarginal fascia, on which are three ocellated black spots with yellow margins and bluish white centres, the largest of which is situate between the second and third median nervules, and the second and third are smallest, fused, and surrounded by the same yellow margin and situate near anal angle and outer margin between the third median nervule and submedian nervure; a submarginal fascia and marginal lines as on anterior wing. Wings beneath pale greyish, mottled with brown, and crossed by two ill-defined central subparallel brownish fasciæ; ocellated spots as above, but more distinct and brighter, and posterior wings having an additional and similar ocellated spot, situate on the subcostal nervules. Body and legs more or less concolorous with wings.

Exp. wings 43 millim.

HAB.—Malay Peninsula; Malacca (Brit. Mus.)—Sumatra (coll. Moore).

This species also exhibits the inconstancy of ocellated macular markings. In the type species described by Butler there was only one spot on upper surface of posterior wings, near anal angle, whilst beneath the duplex one of the specimen here described was single. In another Malaccan specimen in the British Museum there is a fourth very small ocellated spot below the one at apex.

Its nearest allied species is *Y. nareda*, Koll., generally received from North-Eastern India, but probably with a much wider distribution.

## 2. *Ypthima methora*. (Tab. VI., fig. 9.)

*Ypthima methora*, Hewitson, Trans. Ent. Soc. ser. 3, vol. ii. p. 291; t. 18, f. 20, 21 (1865).

*Ypthima methora*, Butl., Cat. Satyr. p. 149, n. 8 (1868); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 537, n. 2 (1877); Moore, Proc. Zool. Soc. 1878, p. 825.

Male. Wings above fuliginous-brown, somewhat mottled with greyish towards outer margins, and with a distinct fuscous submarginal line. Anterior wings with a large and somewhat oblong ocellated spot, situate a little beyond end of cell and placed on the lower discoidal and first median nervules; this spot is black, with an ochraceous margin, and with two inner silvery spots. Posterior wings with a broad paler submarginal fascia, on which are two large submarginal ocellated spots placed between the median nervules, and with faint indications of a third situate above discoidal nervule; these spots are black, with ochraceous margins, and with an inner central silvery spot. Wings beneath pale greyish, mottled with brown, both wings crossed by two waved, irregular, narrow brown fasciæ, the inner one obscure and passing through discoidal cells, the outer one distinct and crossing at cellular apices (there are sometimes faint indications of a third inner basal fascia). Anterior wings with the ocellated spot as above and with a fuscous submarginal line. Posterior wings with six submarginal ocellated spots, of which the two central ones are largest and the lower ones smallest; the upper two are placed on each side of second subcostal nervule, the third and fourth between median nervules, and the fifth and sixth near anal angle between third median nervule and submedian nervure; the upper two are also farthest removed from outer margin, and the sixth and seventh are nearest to the same. Body and legs more or less concolorous with wings.

Female. Hewitson described and figured a female specimen (from "North India") in which the posterior wings exhibit on the upper surface five distinct ocellated spots. It would also appear to be much larger than the male.

Exp. wings, ♂ 36 millim.; ♀ (Hewitson's type) 2 in.\*

HAB.—Continental India; "North India" (coll. Hewit. and Brit. Mus.)—Tenasserim; Naththoung to Paboga (Limborg).—Malay Peninsula; Malacca (Brit. Mus.).

\* 50 millim.

The specimens taken by Capt. Pinwill in Malacca, and which were presented by him to the British Museum, are the only examples I have seen from this region.

### 3. *Ypthima newboldi*. (Tab. IV., fig. 6 ♀.)

*Ypthima Newboldi*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. ix. p. 396 (1882).

Wings above pale brown. Anterior wings with a large subovate pale fascia, placed transversely on apical half, and on which is a large black ocellated spot, with a yellow margin and with two small bluish tale-like centres; this spot is placed a little beyond end of cell, its upper margin extending a little above first discoidal nervule, and its lower margin reaching the second median nervule. Posterior wings with a broad pale submarginal fascia, on which are three ocellated black spots, with yellow margins and bluish tale-like centres, the first and smallest of which is placed between the second subcostal and discoidal nervules, and the other two, which are largest and placed close together, are situate nearer to the outer margin and between the median nervules. Underside of wings pale greyish, mottled with brown; ocellated spots as above, but posterior wings having two additional smaller spots placed close together near anal angle, and between the third median nervule and the submedian nervure; the small spot, as seen above, is much larger beneath. Body and legs more or less concolorous with wings.

Exp. wings, 40 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.).

This species not only differs from *Y. methora* in having five, and not six, ocellated spots on the under surface of the posterior wings (a possible varietal difference only), and also a paler and more unicolorous hue beneath, but also by the shape of the ocellated spot on anterior wings, which is not only larger, but rounder and less oblong; the wings are also longer, the costal margin of the posterior wings being distinctly longer than the outer margin.

I have as yet seen but one specimen, which I captured myself in Province Wellesley.\*

### 4. *Ypthima hübneri*. (Tab. VII., fig. 5 ♀.)

*Ypthima Hübneri*, Kirby, Syn. Cat. Diurn. Lep. p. 95, n. 18 (1871); Snellen, Tijds. Ent. xix. p. 145, n. 11 (1876); *ibid.*, xx. p. 66 (1877); *ibid.*, xxi. p. 7, n. 19 (1878).

*Ypthima philomela*, Hübn. (nec, Linn.), Zutr. Ex. Schmett. f. 83, 84 (1818); Hewitts., Trans. Ent. Soc. ser. 3, vol. ii. p. 284, n. 4 (1865); Butl., Cat. Satyr. p. 152, n. 18 (1868); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 537, n. 1 (1877).

Male and female. Wings above bright, glossy, smoky ochraceous. Anterior wings with a large, ovate ocellated spot placed a little beyond cell, and situate on the two discoidal and first median nervules; this spot is dark fuscous, with two central pale bluish white spots, and outwardly margined with pale ochraceous; outer dark submarginal and marginal lines. Posterior wings with two or three prominent submarginal ocellated spots, of which two are always present and placed between the median nervules, the inner one being largest, and the third and smallest (sometimes absent) is situate between the third median nervule and submedian nervure; these spots are similar in colour to that of the anterior wing, but more rounded, with single pale bluish white central spots, and the area on which they are situate is paler and more or less greyish (the third when present is always more or less imperfect); between the subcostal nervules a spot on the under surface is faintly and obscurely visible above. Wings beneath pale greyish, mottled with slender pale fuscous strigæ; anterior wings with the large spot as above, but brighter, and its outer

\* I have named this species after Capt. Newbold, author of the useful and well-known 'Political and Statistical Account of the British Settlements in the Straits of Malacca.'

margin wider and paler; marginal and submarginal lines as on upper surface; posterior wings with four ocellated spots, the upper of which is placed between the subcostal nervules, the second and third as above, the fourth broad (apparently duplex), with two pale centres and bright outer margin between the third median nervule and the submedian nervure (the artist has slightly misplaced this last spot on the figure). Body and legs more or less concolorous with wings.

Exp. wings, 27 to 33 millim.

HAB.—Continental India; Cachar (Brit. Mus.)—Malay Peninsula; Malacca (Brit. Mus.)—Sumatra (Snellen)—Java; Batavia (Snellen)—Celebes (Snellen).

A female Malaccan specimen in the British Museum, which was collected by Capt. Pinwill, is here figured. The species appears principally to vary in the size and prominence of the ocellated spots on the upper surface.

I follow Mr. Kirby, and adopt his name for the form figured by Hübner as *Y. philomela*, but which is not the species described under that specific name by Linnæus, and which evidently belongs to this genus.

#### Genus ELYMNIAS.

*Elymnia*, Hübner, Verz. bek. Schmett. p. 37 (1816); Butl. Proc. Zool. Soc. 1871, p. 519; Moore, Lep. Ceyl. i. p. 25 (1881).

*Melanitis*, part, Fabr., Illiger's Mag. vi. p. 282 (1807); Westw., Gen. Diurn. Lep. p. 403 (1851).

*Biblis*, part, Latr., Enc. Méth. ix. p. 10 (1819).

Anterior wings short and broad, with the costa strongly arched and convex from base, the apex more or less acutely angular; outer margin somewhat oblique and emarginate, sometimes waved and dentated; inner margin slightly dilated or convex; costal nervure strongly dilated at base; first and second subcostal nervules emitted before the end of cell; upper disco-cellular nervule shortest, strongly angulated at base of first discoidal nervule and very slightly concave along its greatest length; lower disco-cellular strongly concave; first and second median nervules with a common origin, and emitted at lower end of cell. Posterior wings irregularly subovate, with the outer margin more or less waved and generally produced into an obtuse angle or tail near first median nervule; first and second median nervules with a common origin about apex of cell; upper disco-cellular nervule suberect and much shorter than the lower one, which is concave. Eyes naked. Palpi very long and slender, clothed beneath with short compressed hairs, and above with longer, slender, and distinctly separated hairs. Antennæ slender, slightly and gradually thickened towards apex.

I have included this genus in the *Satyrinae*, in which subfamily it possesses a somewhat unique position, not only in general coloration and markings, but also by its neurulation, the first and second median nervules of the anterior wings having a common origin. The term at one time used by Mr. Butler, "*Aberrant Satyrinae*"\* seems therefore very appropriate. Mr. Kirby † followed Herrich-Schäffer in the opinion that these differences were sufficient to establish a distinct subfamily of the *Nymphalidae*, but he also has recently included *Elymnia* in the *Satyrinae*. ‡

In this genus the species possess an almost universal mimicry in colour and markings to protected or inedible species mostly belonging to the *Danaïnae*, but they may, however, be readily

\* Cat. Fabr. Lep. p. 38.

† Syn. Cat. Diurn. Lep. p. 112 (1871).

‡ Zool. Record, 1881; Ins. p. 138.



distinguished from the imitated genera, as Mr. Kirby has remarked,\* by their dentated and often angulated wings.

In *Elymnias* also we find a departure from the typical *Satyrinae* in the partial or complete elimination of the ocellated spots usually found on the wings beneath, to which there is a generally corresponding increased brilliancy of coloration above. The sexual coloration and markings of the few species which occur in this fauna afford several perplexing features to a philosophical explanation. In *E. discrepans* we have the male resembling the corresponding sex of *E. undularis*, and its female having a partial resemblance to the same sex of that species, thus appearing as an imperfect mimic of a tawny Danaid. In *E. nigrescens* both sexes considerably resemble each other, and afford no clue to a mimicked species. In *E. penanga*, however, it is the male which is a strong mimic of a species of *Euplaea*, whilst the female closely resembles nothing but its near ally *E. sumatrana*, both being almost unique in pattern and hue. But in *E. casiphone*, and probably *E. saueri* (of which only the male is at present described), both sexes mimic the corresponding sexes of species belonging to the *Midamus* group of *Euplaea*. Consequently no theoretical conclusions seem at present possible, based on examination of cabinet specimens alone, but the facts should prove suggestive to an enquiring and observing naturalist who could study the habits of the living species in connection with their natural environment.

With the exception of two African species, the members of this genus are found in the Indo- and Austro-Malayan Regions, and, as Mr. Wallace has observed,† these last form two somewhat distinct groups; those from the Austro-Malayan Islands, being “distinguished by a regular and somewhat rounded outline of wings, and resembling in coloration some of the broad-winged *Euplaea*, or the genus *Drusilla*; while the species of India and the Indo-Malayan Islands are almost always characterised by a more irregular outline, waved, toothed, or even caudate, and generally coloured like species of *Danais*, or the more elongate forms of *Euplaea*.” Mr. Butler‡ subsequently divided the species of *Elymnias*, as hitherto understood, into two genera, which, with a few exceptions, agree in the main with Mr. Wallace’s groups.

The genus is of considerable extent, above forty species having been described, but about half of these are now usually placed in the genus *Dyctis*.

Of their life-history we know little. The larva and pupa of the Javan race of *E. undularis* are figured by Horsfield,§ who states|| that the larva “feeds on the Gobbang (*Corypha umbra-culifera*), May.”¶ In Moore’s ‘Lepidoptera of Ceylon,’ the larva and pupa of *E. fraternus* are figured, from drawings made by the Bros. de Alwis, and the larva is there described as feeding on “*Palmaceae*.”

Mr. Wallace describes these butterflies as “forest-haunting insects, frequenting chiefly damp places, where there is a dense herbaceous vegetation. Their flight is slow, resembling that of the *Satyridae* and *Morphidae*.”\*\*

I am at present able to enumerate seven species as belonging to this fauna.

\* ‘Entomologist,’ vol. x. p. 290.

† Trans. Ent. Soc. 1869, p. 321.

‡ Proc. Zool. Soc. 1871, p. 518.

§ Horsf. & Moore. Cat. Lep. Ins. Mus. E. I. C. i. pl. vi. f. 7, 7a.

¶ Ibid. p. 237.

¶ Capt. de la Chaumette (Ent. Mo. Mag. ii. p. 38) describes the perfect insect of this species at Calcutta, as “settling on the trunks of the *Corypha*.”

\*\* Trans. Ent. Soc. 1869, p. 321.

A. Upper disco-cellular nervule of posterior wings suberect, and usually slightly and obliquely directed inwardly.

a. Outer margins of wings dentate and sinuate, posterior wings produced into a more or less well-developed caudate prolongation at apex of first median nervule.

1. *Elymnias discrepans*. (Tab. VI., fig. 2 ♂, 3 ♀.)

*Elymnias discrepans*, Distant, Ann. Mag. Nat. Hist. ser. 5, vol. ix. p. 397 (1882).

Male. Anterior wings above blackish, with the following bright bluish markings:—a short portion of costal area about apex of cell continued in a subapical oblique fascia to lower discoidal nervule, and followed by four submarginal spots, placed between the nervules; outer margin shaded with castaneous-brown. Posterior wings blackish, but somewhat paler than the anterior wings, and with a broad castaneous-brown marginal band. Wings beneath castaneous-brown, thickly mottled with pale strigæ; anterior wings with a more or less distinct pale apical area, which is continued along outer margin; posterior wings with a more or less distinct pale, broad, and irregular submarginal fascia, and with a very pale bright bluish spot near costa, situate between the subcostal nervules\* (this spot is sometimes absent). Body and legs more or less concolorous with wings. Antennæ variable in hue, sometimes stramineous, mottled with brown above and pale stramineous beneath; or fuscous above and stramineous mottled with brown beneath, with the apex pale stramineous.

Female. Anterior wings above as in male, but with a large ochraceous, basal area, which occupies lower portion of cell, the greater part of the space between second median nervule and submedian nervule, and terminates near end of cell and the bases of the first and second median nervules; the subapical fascia and submarginal spots larger and paler blue in colour. Posterior wings pale fuscous, becoming paler and shaded with dull ochraceous towards outer margin, and with a more or less distinct pale submarginal spot, situate between the discoidal and first median nervules. Wings beneath much paler than in male; the anterior wings ochraceous near inner margin; posterior wings with a very broad and well-defined pale marginal fascia, and with a very pale bluish spot, situate as in male. Body and legs more or less concolorous with wings.

Exp. wings, ♂ 53 to 68 millim.; ♀ (one specimen) 60 millim.

HAB.—Malay Peninsula; Penang (coll. Dist.); Province Wellesley (colls. Dist. and Sauer).

This form has frequently been referred to by some writers as *E. undularis*. Mr. Wallace pursued this course in 1869, † remarking, however, “this very variable species cannot be separated into its local forms, or races, without much more complete materials than at present exist.” Since that time such material has been procured, and as other races of this species have received distinctive names it became necessary for me to treat this local form in the same manner. The true *E. undularis* appears to be confined to Continental India, of which another local race in Upper Tenasserim has been described by Mr. Moore. ‡ In *E. discrepans* the greatest amount of colour differentiation is found in the female, which also, in comparison with the other sex, appears to be very scarce and rare. More than a hundred male specimens of this species have passed through my hands, but the only female specimen I have received is the one which is here described and figured. As I collected in Province Wellesley myself, where the male is a rather common insect, and have examined several collections since my return, this sexual disparity is very perceptible. It may, however, be more apparent than real, owing to the

\* In the figure here given the artist has accidentally and erroneously placed this spot above the subcostal nervules.

† Trans. Ent. Soc. 1869, p. 322.

‡ Proc. Zool. Soc. 1878, p. 826.

possibility of the females having different habits to those of the other sex, and therefore being less easily captured.\*

2. *Elymnias nigrescens*. (Tab. VI., fig. 1 ♀, and Tab. IX., fig. 1 ♀.)

*Elymnias nigrescens*, Butler, Proc. Zool. Soc. 1871, p. 520, n. 2, pl. xlii. f. 1; Druce, Proc. Zool. Soc. 1873, p. 340, n. 2; Butl., Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 537, n. 1 (1877); Godm. & Salv., Proc. Zool. Soc. 1878, p. 638, n. 11.

Male. Wings both above and beneath resembling those of the male of *E. discrepans*, but with the bluish subapical fascia and submarginal spots considerably larger.

(In some specimens, and notably a Bornean one in the collection of the British Museum, the posterior wings have the pale submarginal spots, as found in most females; these are very faintly visible in Malaccan male specimens in the same collection.)

Female. Anterior wings above dark, glossy fuscous, with the basal area more or less suffused with castaneous-red, with the bluish subapical fascia and submarginal spots as in male, but which are much larger and paler in colour. Posterior wings fuscous, becoming paler towards outer margin (the outer margin is sometimes dull ochraceous as in the specimen figured Tab. IX., f. 1), and with a submarginal row of four white spots placed between the nervules, of which the first and smallest is placed above the discoidal nervule, and the fourth is situate between the second and third median nervules (a fifth small and faintly marked spot is found in some specimens between the third median nervule and submedian nervure). These spots are very inconstant, being practically obsolete in the specimen figured (Tab. VI., f. 1). Wings beneath similar in pattern and coloration to those of the same sex of *E. discrepans*.

Exp. wings, ♂ 68 millim.; † ♀ 72 to 77 millim.

HAB.—Malay Peninsula; Province Wellesley (colls. Dist. & Sauer); Malacca (Brit. Mus.)—Billiton (coll. Godm. & Salv.)—Borneo (Brit. Mus.)

This species or race is one which affords much difficulty and doubt as to its distinctive position. I have neither seen nor received any male specimens from Province Wellesley, though females are not uncommon from that district. The British Museum, however, possesses several male specimens which were collected by Capt. Pinwill in Malacca, but these do not altogether agree with the Bornean typical specimen described by Butler. The difference is principally that of faintness or partial obliteration of the submarginal white spots to the posterior wings, but as this is a variable character in female specimens, collected in such a limited area as Province Wellesley, evidence of which is afforded by the two figures here given, I naturally predicate the same amount of variability in the other sex. Another peculiarity of *E. nigrescens* is the considerable similarity of the sexes.

Are *E. discrepans* and *E. nigrescens* but seasonal varieties of one species? This is neither impossible nor improbable, but can only be denied or affirmed by some local student who will carefully breed both forms. It is the want of this information that makes the present study and classification of exotic Lepidoptera of so empirical a character.

\* Mr. Bates has also stated that in a number of species of butterflies which he observed on the Upper Amazons the males were more numerous than the females, in the proportion of a hundred to one. However, no universal rule in this respect obtains in the *Rhopalocera*, and the whole subject has been exhaustively discussed by Mr. Darwin, in his 'Descent of Man' (2nd edit. p. 250).

† Butler's type expanded "unc. 2, lin. 10."

3. *Elymnias lutescens*. (Tab. VI., fig. 4 ♂, 5 ♀.)

*Elymnias lutescens*, Butler, Ann. & Mag. Nat. Hist. ser. 3, vol. xx. p. 404, t. 9, f. 10 (1867); Wall, Trans. Ent. Soc. 1869, p. 323, n. 4; Butl., Proc. Zool. Soc. 1871, p. 521, n. 6; Druce, Proc. Zool. Soc. 1873, p. 340, n. 4.

*Elymnias Panthera*, var. *Lutescens*, Kirby, Syn. Cat. Diurn. Lep. p. 112, n. 4 (1871).

Male. Wings above dark glossy fuscous; anterior wings with the outer margin somewhat broadly and slightly paler; posterior wings with a broad, pale greyish submarginal fascia, the inner margin of which is somewhat scalloped between the nervules; this is broadest near anal angle and narrowest at apex, and contains a series of prominent fuscous spots placed between the nervules, two between third median nervule and submedian nervure, the others placed singly (these spots are variable in number, not being found above first median nervule in the specimen figured, but in other specimens continued towards apex). Wings beneath pale castaneous, mottled with numerous greyish strigæ, and with a more or less well-defined broad submarginal fascia, which is broadest and most clearly defined on posterior wings, and there possesses six dark blue rounded spots, with pale blue centres, which are continued in streaks beyond their inner margins; these spots are placed between the nervules, the first above discoidal nervule and the fifth and sixth together between the third median nervule and submedian nervure; a pale and bright bluish spot between the subcostal nervules. Body and legs more or less concolorous with wings.

Female. Larger than male; the wings above paler and more ferruginous; anterior wings with a broad and well-defined outer ferruginous fascia; posterior wings with the pale submarginal fascia broader and less scalloped inwardly than in male, and with five or six fuscous spots with paler centres placed between the nervules. Wings beneath paler than in male, but with the posterior wings spotted as in that sex.

NOTE.—The tail-like prolongation of the posterior wings at the apex of the first median nervule is longest in the female. In the male specimen, however, here figured, the prolongation of the left posterior wing has its apex mutilated.

Exp. wings, ♂ 65 to 73 millim; ♀ (one specimen) 78 millim.

HAB.—Malay Peninsula; Penang; Province Wellesley (colls. Dist. & Sauer); Malacca (coll. Moore); Ayerpanas (coll. Roberts); Singapore (coll. Roberts)—Sumatra (Wallace)—Borneo (coll. Godm. & Salv.; Brit. Mus.).

As regards the variation of this species, especially of the females, Mr. Wallace writes,\* “The female from Sumatra has less red on the upper wings, one from Borneo has the pale bands almost obsolete, while another has them more distinct, especially across the apex of the anterior wings.”

4. *Elymnias lais*. (Tab. IX., fig. 2 ♂.)

*Papilio Lais*, Cramer, Pap. Ex. ii. t. 114, A, B (1779); Fabr., Sp. Ins. p. 102, n. 448 (1781); Mant. Ins. p. 55, n. 543 (1787); Ent. Syst. iii. p. 58, n. 182 (1793).

*Biblis Lais*, Godt., Enc. Méth. ix. p. 326, n. 4 (1819).

*Melanitis Lais*, Doub. & Westw., Gen. Diurn. Lep. p. 404, n. 1 (1851).

*Elymnias Lais*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 237, n. 510 (1857); Wall., Trans. Ent. Soc. 1869, p. 325, n. 11; Butl., Cat. Fabr. Lepid. p. 38, n. 4 (1869); Proc. Zool. Soc. 1871, p. 522, n. 10; Druce, Proc. Zool. Soc. 1873, p. 340; *ibid.*, 1874, p. 104, n. 2; Godm. & Salv., Proc. Zool. Soc. 1878, p. 638, n. 12.

Male. Wings above dark chocolate-brown, variegated with greenish markings. Anterior wings with the costal area (particularly the basal portion) irrorated with numerous greyish spots and strigæ; a large

\* Trans. Ent. Soc. 1869, p. 323. As Mr. Wallace examined other collections with his own very extensive one of *Elymniads*, and combined in himself a knowledge of their habits in nature with cabinet discrimination, I feel always satisfied to quote his remarks.

greenish fascia in cell, narrowest at base, and widened and somewhat truncate near apex, and with the following longitudinal fasciæ of the same colour placed between the nervules:—the upper two are placed above and below the first discoidal nervule, and are very faint and slender, with their apices broad and macular; the third above first median nervule is slender, but macular at both ends, and inwardly approaches the disco-cellular fascia; the following three separated by the median nervules are broadest at base, narrowing at apical portion, but macular at apex, and the last runs along the inner margin. Posterior wings with similar longitudinal fasciæ as on upper wings, and which are also placed between the nervules, but are broken near their apices, which thus appear as a submarginal series of spots; of these fasciæ the inner two (placed on each side of the submedian nervure) are longest, and the upper two (placed on each side of the discoidal nervule) are the faintest; there is also a very faint disco-cellular streak.

Wings beneath dull greyish, suffused with fuscous, and mottled with dark strigæ; on anterior wings these become more or less confluent and dark chocolate in colour, forming an irregular spot in cell, a larger irregular spot or fascia at end of cell, and appearing very prominent towards outer margin; on posterior wings these darker shadings do not extend beyond basal half of wing, but again appear as a more or less well-defined outer submarginal fascia. Body and legs more or less concolorous with wings.

Female. Somewhat larger than the male, the fasciæ and spots of the upper surface being creamy in hue, and with the outer margins of both wings distinctly and somewhat brightly castaneous. Beneath the wings are much paler, and the numerous shadings are of like pattern but fainter impression.

Exp. wings, ♂ 63 to 72 millim.; ♀ 82 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Säuer)—Sumatra (Wallace)—Billiton (coll. Godm. & Salv.)—Java (colls. Horsf. & Dist.)—Borneo (Druce)—Siam; Nahconhaisee (coll. Godm. & Salv.).

The only specimen of this species which I have seen from the Malay Peninsula, and which is here figured, is contained in the collection made in Province Wellesley by Mr. Säuer. A Javan male specimen in my own collection is smaller, and with the markings above more decidedly green; this character, however, is not constant, as Mr. Wallace writes,\* “the Java specimens (Cramer’s types) agree very closely with those of Sumatra and Borneo in the males.”

aa. *Outer margins of wings slightly sinuate; posterior wings without a well-developed caudate prolongation at apex of first median nervule.*

5. **Elymnias penanga.** (Tab. VII., fig. 6 ♂; Tab. VI., fig. 11 ♀.)

*Melanitis Penanga*, Westwood, Gen. Diurn. Lep. p. 405, n. 9, note (1851).

*Elymnias Penanga*, Wall., Trans. Ent. Soc. 1869, p. 325, n. 9; Butl., Proc. Zool. Soc. 1871, p. 521, n. 8.

*Melanitis Mehida*, Hewits., Ex. Butt. iii. *Melanitis*, t. 1, f. 2, 3 (1863).

*Elymnias Mehida*, Wall., Trans. Ent. Soc. 1869, p. 323, n. 5; Butl., Proc. Zool. Soc. 1871, p. 523, n. 16; Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 538, n. 2 (1877).

Male. Anterior wings above purplish brown, with very strong bright blue reflections, which become more fixed and distinct on apical half, and with five pale blue elongate spots, of which the upper two are longest, and are situate on each side of lower discoidal nervule; the remaining three being much smaller, and divided by the median nervules. The bluish reflection does not extend to the outer margin, which is distinctly purplish brown. Posterior wings purplish brown, with bright bluish reflections, but less intense than on anterior wings. Wings beneath castaneous-brown, much mottled with paler strigæ, which on anterior wings form a more or less distinct subapical space, widest at costa and narrowing downwards beneath cell; space beneath third median nervule much paler; posterior wings with the basal portion to a

\* Trans. Ent. Soc. 1869, p. 325.

little beyond apex of cell dark castaneous, remainder much paler and thickly irrorated with the pale strigæ, and with two or three small but distinct dark submarginal spots situate between the median nervules; a somewhat large pale stramineous spot, near costa, placed between the subcostal nervules. Body and legs more or less concolorous with wings.

Female. Wings above obscure bluish brown, as in the specimen figured, or with brighter indigo shadings, as in other specimens. Anterior wings crossed by a broad subapical white fascia, commencing at costa and terminating about second median nervule. Posterior wings slightly paler on disk. Wings beneath generally marked as in male, but with the ground colour much darker (this is somewhat variable, being little paler than above, as in the specimen figured, or more shaded with castaneous, as in other specimens), and with the subapical whitish fascia of anterior wings above, more diffused towards apex beneath. The pale subcostal spot on the under surface of posterior wings of the male is generally absent in the female, though present in the typical female form of the species contained in the British Museum.

Exp. wings, ♂ 65 to 68 millim.; ♀ 70 millim.

HAB.—Malay Peninsula; Province Wellesley (colls. Dist. & Sauer); Malacca (Brit. Mus.)—Singapore (coll. Hewits.).

The male form here described and figured (Tab. VII., fig. 6) was described by Mr. Hewitson under the name of *M. mehida*, whilst the female form (Tab. VI., fig. 11) is the typical *M. penanga* of Prof. Westwood. Mr. Hewitson appended to his description of *M. mehida* the remark, "This and *M. penanga* are very probably the sexes of one species." The form, however, which he figured as *M. penanga*\* was a closely allied but distinct Sumatran race, which Mr. Wallace has very properly separated under a distinctive name.†

The two forms, however, are sufficiently similar to show that Hewitson exhibited acumen in making that remark. Having found all the specimens I have examined to exhibit sexual constancy with the different coloration, and as the underside of the two forms are so very similar, ‡ I have felt constrained to consider the descriptions of both Westwood and Hewitson as referring to the sexes of one species, and Westwood's name has therefore priority.

This race or species appears to be quite confined to the Malay Peninsula. A recent writer § has included it in a list of Sumatran butterflies, but all the Sumatran specimens which I have seen in collections represent the *E. sumatrana*, Wall.

B. Upper disco-cellular nervule of posterior wings obliquely directed outwardly.

#### 6. *Elymnias casiphone*. (Tab. VI., fig. 10 ♂.)

*Elymnias casiphone*, Hübner, Samml. ex. Schm. iii. (1816–1824); Wall., Trans. Ent. Soc. 1869, p. 325, n. 12

Butl., Trans. Ent. Soc. 1870, p. 488; Proc. Zool. Soc. 1871, p. 522, n. 14.

*Melanitis casiphone*, Doubl. & Westw., Gen. Diurn. Lep. p. 404, n. 3 (1851).

Male. Wings above pale chocolate-brown. Anterior wings with the apical area much suffused with violaceous and with the following pale greyish macular markings; a number of irregularly-sized and shaped spots on costal area, gradually increasing in size from base; a rounded spot just beyond end of cell; two discal spots divided by the second median nervule, and a submarginal series of six spots, divided

\* Exot. Butt. iii. *Melanitis*, t. 1, f. 1, 4 (1863).

† Trans. Ent. Soc. 1869, p. 325, n. 10.

‡ The female example of *E. penanga*, here figured, is probably that of a somewhat faded specimen, as the under surface of the wings is generally of a warmer tint, and more concolorous in hue, and similar in markings with the corresponding surface of the wings in male specimens.

§ Smith in Bock., 'Head Hunters of Borneo,' Append. V,

by the nervules, the first and innermost of which is placed above the upper discoidal nervule, and the sixth between the third median nervule and submedian nervule. Posterior wings with a submarginal series of obscure greyish spots, preceded by a few discal spots of the same colour. Wings beneath pale ferruginous, mottled with numerous and irregularly-sized chocolate strigæ. Anterior wings with a costal series of pale greyish spots; four larger pale discal spots situate one beyond end of cell, two divided by the second median nervule, and the fourth placed between the discoidal nervules; there are also faint indications of a submarginal series of spots placed between the nervules, of which the two most prominent are placed above and beneath the third median nervule. Posterior wings with some dark and confluent strigæ principally distributed on basal half, and with a prominent dark submarginal fascia, which is preceded by pale greyish, and followed by several narrower, waved, and somewhat fused dark marginal fasciæ. Body and legs more or less concolorous with wings.

Exp. wings, ♂ 65 millim.

Female. I have not been able to examine this sex, but Mr. Butler\* has described a female specimen as of this species, which was collected in Singapore by Lieut. Roberts, as follows:—"♀. Above, same pattern as *E. timandra*, ♀, Wallace,† but the whole apical area pale violet, and the rest of the ground-colour of a browner tint than in that species. Below, markings the same as in the male, but ill-defined, the hind wings whitish."

Exp. wings, "3¼ inches."

HAB.—Malay Peninsula.—Singapore (Butler).—Java (Wallace, and coll. Godm. & Salv.).

I have enumerated this species entirely on the authority of Mr. Butler's determination of the specimen collected at Singapore by Lieut. Roberts, in whose collection it remains, and which I have not seen.

## 7. *Elymnias saüeri*. (Tab. IX., fig. 3 ♂.)

*Elymnias saüeri*, n. sp.

Male. Anterior wings dark violaceous, with paler suffusions on apical area, and with the following very pale violaceous spots:—three discal; one large, placed between first and second median nervules, the others exceedingly small and indistinct, and situate between the discoidal nervules and between the second and third median nervules; five large submarginal spots, divided by the nervules, of which the two upper, inner, and largest are contiguous and separated by the lower discoidal nervule, the fifth being situate between the third median nervule and the submedian nervule; there is also a very faint indication of a spot at end of cell. Costal area with basal third minutely spotted with greyish, remaining portion with three or four pale bluish spots. Posterior wings castaneous, with the basal area fuscous. The extreme margins of both wings are alternately fuscous and white. Wings beneath pale ferruginous, thickly mottled with dark chocolate-brown strigæ, irregular in shape and size. Anterior wings with a number of pale greyish spots on costal area; the upper portion of cell and apical area somewhat paler in hue, and with indications of a dark waved fascia near end of cell. Posterior wings somewhat darker, the strigæ being more numerous and contiguous, with indications of a much-waved and irregular dark fascia crossing wings about end of cell, and a more or less distinct, broad, submarginal fascia, followed by several waved, broken, and indistinct lines. Body and legs more or less concolorous with wings.

Exp. wings, 85 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Saüer).‡

\* Trans. Ent. Soc. 1870, p. 488.

† This is a closely allied or local form of *E. lais*, and is found in Burma and Silhet.

‡ Since this description was written a specimen collected by Capt. Bingham in Tenasserim, has been presented to the British Museum.

This fine species is somewhat intermediate between *E. casiphone* and *E. leucocyma*,\* agreeing best with the last above, and with the first beneath. It appears to be a mimic of a species of *Euploea* belonging to the *midamus* group, though the female still remains to be discovered. It was captured in Province Wellesley by Mr. Sauer, an enthusiastic collector of the Lepidoptera of the beautiful region in which he at present resides, and after whom I have named the species.

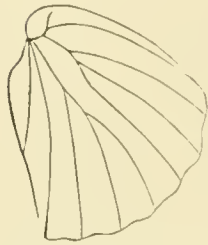


FIG. 16.—Post. wing of *Discophora tullia*, ♂.

#### Subfam. NYMPHALINÆ.

*Nymphalinae*, Bates, Journ. Ent. ii. p. 176 (1864); Moore, Lep. Ceyl. i. p. 26 (1881).

*Nymphalidæ* and *Eurytelidæ*, p., Westw., Gen. Diurn. Lep. pp. 143, 403 (1851–2).

*Morphidæ*, p., Westw., Gen. Diurn. Lep. p. 332 (1851).

*Morphinæ*, Godm. & Salv., Biol. Centr. Am. Rhop. p. 113 (1881).

Discoidal cell of the posterior wing open, the lower disco-cellular nervule being more or less atrophied. Larvæ variable in form.

Most authors treat the *Nymphalinae* and *Morphinæ* as separate subfamilies, but though I have endeavoured, by studying the views of my contemporaries, to find characters that would enable me to follow that course, I can only subscribe to the dictum of the founder of the *Nymphalinae*, that the genera grouped under the *Morphinæ* as a subfamily “exhibit no good character whereby they may be distinguished from the *Nymphalinae*.” † Most authors who have followed the opposite course have also doubted the classificatory value of the *Morphinæ*. Prof. Westwood, when he diagnosed the fam. *Morphidæ*, ‡ clearly stated that he followed the views of Mr. E. Doubleday, a course the more necessary owing to the plates illustrating the work having been already inscribed with the “distinct family headings.” In his very exhaustive paper, “On the Oriental Species of Butterflies related to the Genus *Morpho*,” a memoir which particularly applies to this fauna, Prof. Westwood has also expressed the view § that he found it “next to impossible to draw any (even an artificial) line of separation” between some of the genera, which are thus divided in subfamiliar estrangement, an opinion further strengthened by earlier argument. || Mr. Kirby, who enumerates and uses the subfamily *Morphinæ*, in his ‘Synonymic Catalogue,’ subsequently qualifies that course by stating, “The *Morphinæ* are a group of butterflies perhaps only artificially separated from the *Nymphalinae* ;” ¶ and to add to the perplexity he has referred the foundation of the *Morphinæ* (under that name) to Mr. Butler, \*\* who has (at least where quoted) given neither diagnosis nor reason for such division. On the other hand, however, Messrs. Godman and Salvin, without entering into the argument of classification, “think that these butterflies have associated characters of sufficient number and value to allow them to stand as a separate subfamily *Morphinæ*.” ††

It is here proposed to separate the *Nymphalinae* into two groups, principally based on the characters of the palpi.

\* A species received from Silhet.

† Gen. Diurn. Lep. p. 332.

|| Introd. Mod. Class. Ins. ii. p. 353.

\*\* Cist. Ent. i. p. 3.

† Bates, Journ. Ent. ii. p. 177.

§ Trans. Ent. Soc. vol. iv. N.S. p. 169.

¶ ‘Entomologist,’ vol. x. p. 290.

†† Biol. Centr. Am. Rhop. p. 113.



Group *MORPHINA*.

Palpi slender, the anterior margins not dilated.

Larvæ (as at present described) with a more or less developed bifid tail.



FIG. 17.—Head, showing palpi of *Amathusia phidippus*.

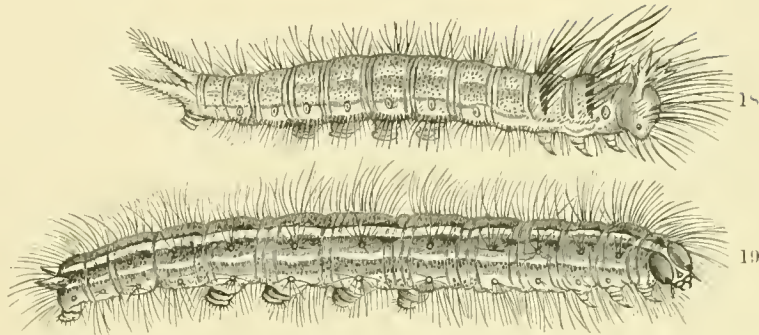


FIG. 18.—Larva of *Amathusia phidippus* (from Horsf. Cat. Lep. Mus. E. I. C.)  
FIG. 19.— „ „ *Discophora celinde* „ „

This division corresponds with the subfamily *Morphinae* of many authorities (*ante* p. 66), and includes not only some of the largest Nymphalinous butterflies, but also (especially in the American genus *Morpho*) examples of the most beautiful species to be found in the whole Rhopalocera. The genus *Morpho* is, in fact, the type of this division, and also its sole representative in the American tropics, whilst nine other genera are distributed throughout the tropical regions of the East. The genus *Morpho* is remarkable for the resplendent blue coloration or tints of the wings of its species, and possesses as its nearest ally in the East the beautiful genus *Thaumantis*. It was an eloquent remark of Humboldt, when comparing the plants of Equinoctial America with those of Europe, that “when Nature does not present the same species, she loves to repeat the same genera;” \* and some of the older entomologists † described Oriental species as belonging to the genus *Morpho* which have subsequently, and more correctly, been placed in that of *Thaumantis*.

The presence of these two closely allied genera *Morpho* and *Thaumantis* in such widely separated areas as the Neotropical ‡ and Indo-Malayan regions is possible of explanation by a slight reference to other corresponding biological facts. Thus, in Mammalia, the genus *Tapirus* has a somewhat similar distribution, and, although restricted in the number of species, is also only found in these regions. But it is known that in Tertiary times, both Miocene and Pliocene, the Tapir inhabited Europe, and its fossil teeth are, even in this country, found in the Norfolk and Suffolk crag deposits, whilst in the Pleistocene period in North America it extended as far north as the Valley of the Mississippi. The geological argument is, however, too extensive for discussion here, but Mr. Wallace has attentively studied it, and can be quoted:—“North America was evidently in very early times so far connected with Europe and Asia as to interchange with those continents the higher types of animal life as they were successively

\* ‘Person. Narrative,’ Bohn’s edit., vol. i. p. 424.

† Godart and Zinken-Sommer.

‡ The Neotropical region of Dr. Selater includes all South America, the Antilles, and tropical portion of North America. The tropical portions of this region are here alone referred to.

developed in either hemisphere."\* And the same author, in a popular manner, has drawn attention to the migration of characteristic South American mammals to North America in the Post-Pliocene epoch. †

Now facts point to a similar conclusion respecting this distribution of the butterflies. In the European Eocene formations at Aix, in Provence, five fossil butterflies have been discovered and described. Of these two belong to the *Satyridae* (to which the *Morphine* are allied), and Mr. Scudder, who has written an excellent monograph on Fossil Butterflies and particularly studied these fossils, thus concludes:—"Three out of the five Aix butterflies therefore find their nearest living allies in the Indo-Malayan region, one is most closely related to forms now found in Tropical America, and one is at home in its own resting place." ‡ Mr. Thiselton-Dyer has pointed out similar coincidences with plants, especially in the tropical order *Ternstroemiaceae*, "Out of thirty-two genera as many as five are represented in the Indo-Malayan and South American floras," § and he inclines to the view of a transverse connection between the different branches of the tropical flora in the northern hemisphere during the early part of the Tertiary period. ||

This group possesses considerable affinity with the *Satyrinae*, not only by the ocellated spots on the under-surfaces of the posterior wings, but also in the larval form, as shown by the two figures (figs. 18 & 19). Both of these possess bifid tails, ¶ as in that subfamily, though one only has the head bicornuted.\*\* The details of the larval forms of the different species in this group are much desiderated.

Six genera are found in the Malay Peninsula.

\* 'Tropical Nature,' p. 339.

† Ibid. The whole discussion is carried out more fully in the same author's 'Geogr. Distr. Anim.'

‡ "Fossil Butterflies," Mem. Am. Ass. Adv. Scien. 1875, p. 77. An excellent *resumé* and description of the fossil entomology of Aix has been given by Mr. Herbert Goss, in "The Insect Fauna of the Recent and Tertiary Periods," Proc. Geol. Assoc. v. n. 6, p. 29 (1877).

§ "On Plant-Distrib. as a Field for Geogr. Research." From Proc. Geogr. Soc. vol. xxii. n. 6, p. 30 (1878).

|| Ibid. p. 24.

NOTE.—It has been generally assumed that a land-connection existed in Tertiary times between Europe and America. Thus Prof. Boyd Dawkins, one of the latest exponents, declares ('Early Man in Britain,' p. 20), "The chief botanists of the present time—Hooker, Dyer, Saporta, Dawson, and Asa Gray—are agreed that the north polar region was the centre from which the Tertiary floras have been dispersed over the New and Old Worlds;" and the same author (*ibid.* p. 23) considers that there is evidence to prove the existence of a great Eocene continent, which including Britain (then connected with Western France) extended to America by way of Iceland and Greenland, and was continuous with Norway and Spitzbergen. "This great north-western continent, or northern Atlantis," existed through the Eocene and Miocene ages, "offering a means of free migration for plants and animals, and it was not finally broken up by submergence" till the beginning of the Pliocene age. Mr. A. Tylor (Geol. Mag. vol. ix. p. 488), arguing that "the elevation of the Alps in the Miocene period must have been accompanied by a much larger movement of depression," thinks that probably "at the time a Miocene island or continent (near Plato's Atlantis) in the Atlantic was suddenly depressed."

An alternative hypothesis to that of now submerged land-connection has been formulated by Mr. A. Tylor (Geol. Mag. vol. ix. 392), that in the Glacial period the ice-cap at the Poles was sufficient to reduce the level of the sea by at least 600 feet; and Mr. Belt ('Naturalist in Nicaragua,' p. 266) was willing to propose a lowering of the level of the sea to 1000 feet.

\* The larvæ of *Morpho laertes* and *M. epistrophis*, as figured by Dr. Burmeister (Descrip. Physiq. de la Republ. Argent.—Buenos Ayres—vol. v. Atlas, pl. vii. f. 1, 2, 3, 4), have the caudate anal appendages rudimentary, but still distinct. In the representation of the larva of *Morpho achilles* by Mme. Merian (Metamorph. Insect. Surinamens. pl. vii.), the structural details of which have not been criticised by Dr. Burmeister in his reference to the same, these "bifid tails" are prominently developed.

\*\* Dr. Burmeister in the text of the above quoted work (p. 189), in the diagnosis of his section *Morphidae* of his subfamily *Morphoides*, writes "Chenilles sans cornes sur la tête," which, though true of the genus *Morpho*, is certainly contrary to the structure of the larva of *Amathusia philippus* as here figured.

SYNOPSIS OF GENERA.

1. Discoidal cell to posterior wings partly closed by an atrophied lower disco-cellular nervule.
  - A. Subcostal nervules of anterior wings free.
    - a. Discoidal nervules of anterior wings well separated at their origin.
    - b. First median nervule of anterior wings strongly angulated near base.
    - c. Anterior wings with inner margin nearly straight, and apical angle not acute.
    - d. Anal angle of posterior wings produced in caudate prolongation. - - - - - AMATHUSIA.
  - AA. First subcostal nervule of anterior wings anastomosing with costal nervule.
    - bb. First median nervule of anterior wings strongly angulated near base, emitting a short oblique nervule, which connected with a fold of the wing gives the appearance of an additional median nervule.
    - cc. Anterior wings with inner margin dilated and convex in ♂, and apical angle acute. - - - - - ZEUZIDIA.
2. Discoidal cell to posterior wings open, lower disco-cellular nervule entirely absent.
  - aa. Discoidal nervules of anterior wings with their bases contiguous.
    - bbb. First median nervule of anterior wings slightly arched, but not angulated near base.
    - ccc. Anterior wings with inner margin nearly straight, and apical angle acute.
    - dd. Outer margin of posterior wings obtusely angulated at apex of first median nervule. - - - - - DISCOPHORA.
  - aaa. Discoidal nervules of anterior wings well separated at their origin.
    - bbbb. First median nervule of anterior wings strongly arched, but not angulated near base.
    - cccc. Anterior wings with inner margin nearly straight, and apical angle not acute.
    - ddd. Anal angle of posterior wings rounded, or sometimes produced in caudate prolongation. - - - - - THAUMANTIS.
  - B. Subcostal nervules of anterior wings free, the second, third and fourth emitted moderately close together and equidistant.
    - bbbbb. First median nervule of anterior wings neither prominently arched nor angulated near base.
    - ccccc. Anterior wings with inner margin slightly dilated at base in ♂, the apical angle rounded.
    - dddd. Posterior wings ovate, the anal angle rounded.
      - c. Bifurcation of subcostal nervules and apparent base of upper disco-cellular nervule to posterior wings contiguous. - - - - - CLEROME.
  - BB. Second and third median nervules of anterior wings emitted some distance apart.
    - ddddd. Posterior wings subovate and subelongate.
      - ce. Bifurcation of subcostal nervules and apparent base of upper disco-cellular nervule to posterior wings remote. - - - - - XANTHOTENIA.



FIG. 20.—Post. wing, *Amathusia phidippus*, showing apex of cell partly closed by atrophied nervule.



FIG. 21.—Ant. wing, *Amathusia phidippus*, showing subcostal nervules, bases of discoidal nervules and base of first median nervule.



FIG. 22.—Ant. wing, *Zeuzidia amethystus*, showing base of first median nervule, with oblique supplementary nervule attached to fold in wing (dotted line).



FIG. 23.—Ant. wing, *Discophora celinde*, showing arrangement of subcostal nervules and bases of discoidal nervules.



FIG. 24.—Post. wing, *Clerome gracilis*, showing bifurcation of subcostal nervules and apparent base of upper disco-cellular nervule.

## Genus AMATHUSIA.

*Amathusia*, Fabricius, Illiger's Mag. vi. p. 279 (1807); Westw., Gen. Diurn. Lep. p. 326 (1850).

*Mitocerus*, Billb., Enum. Ins. p. 79 (1820); Scudd. Proc. Am. Acad. Arts & Sc. x. p. 220 (1875).

Anterior wings subtriangular, the costal margin strongly arched, the apex not acute and very slightly rounded. First subcostal nervule emitted before end of cell at three-fourths of its length, remaining subcostal nervules emitted close together on apical fourth of wing. Upper disco-cellular nervule shortly, obliquely, and outwardly directed at base, and suberect along its greater length; lower disco-cellular suberect and slightly concave at base and then directed obliquely outwards for its greatest length. Discoidal nervules well separated at their origin. First median nervule with its base directed obliquely upwards in a line with the median nervure, and then abruptly deflexed to outer margin. Posterior wings subtriangular; costal margin arched; outer margin rounded and scalloped; anal angle produced into a broad, spatulate, tail-like prolongation between the apices of the third median nervule and the submedian nervure. Discoidal cell partly closed by an atrophied and curved disco-cellular nervule. In male specimens these wings possess two tufts of hair, probably concealing scent-secretory glands or pouches, the first in the neighbourhood of the submedian nervure, and the second and smaller tuft between that nervure and the third median nervule. The terminal joints of the abdomen are also furnished with tufts of hair.

This genus is of moderate extent, including some eight or nine species. It has a somewhat restricted area, which extends from Continental India to a little beyond the Indo-Malayan region. At present but one species is known as inhabiting the Malay Peninsula.

1. *Amathusia phidippus*. (Tab. VI., fig. 6 ♂, 7 ♀.)

*Papilio Phidippus*, Linnæus, Syst. Nat. i. 2, p. 752, n. 37 (1767); Joh. Amcæn. Acad. vi. p. 402, n. 52 (1764); Fabr. Syst. Ent. p. 455, n. 52 (1775); Sp. Ins. p. 21, n. 85 (1781); Mant. Ins. p. 11, n. 97 (1787); Ent. Syst. iii. p. 71, n. 220 (1793); Cram. Pap. Ex. i. t. 69, A, B (1779).

*Morpho Phidippus*, Godt. Enc. Méth. ix. p. 439, n. 2 (1823).

*Amathusia Phidippus*, Doubl. Hew. Gen. Diurn. Lep. t. 54\*, f. 2 (1850); Horsf. & Moore, Cat. Lep. Mus. E. I. C. p. 209, n. 428 (1857); Butl. Cat. Fabr. Lep. p. 45, n. 2 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 538, n. 1 (1877); Druce, Proc. Zool. Soc. 1873, p. 340, n. 1; *ibid.* 1874, p. 104, n. 1; Moore, Proc. Zool. Soc. 1877, p. 583; *ibid.* 1878, p. 826; Godm. & Salv. Proc. Zool. Soc. 1878, p. 638, n. 13; Snellen, Tijd. Ent. xix. p. 147, n. 21 (1876); *ibid.* xx. p. 66 (1877); *ibid.* xxi. p. 11, n. 42 (1878).

Male. Wings above dark fuliginous-brown. Anterior wings with the costal and outer margins somewhat paler, and with a distinctly paler submarginal fascia. Posterior wings with the outer margin paler and with a distinctly paler submarginal fascia, the marginal fringe ochraceous and the anal-angular caudate prolongation somewhat paler, with two sublunate black spots, outwardly margined with white; these spots are placed near the apices of the third median nervule and submedian nervure. Wings beneath greyish, crossed by numerous fuscous fasciæ of varying width and hue; the first commences near costal base of anterior wings, and is continued on posterior wings, narrowing and becoming somewhat evanescent a little beyond the middle of submedian nervure; the second crosses the cells of both wings about their centres, and terminates on inner side of third median nervule at about half its length; the third is short, crossing cell, but not passing median nervule of anterior wings; the fourth is pale, with its margins darker, waved, and deflexed beneath the third fascia on anterior wing, passing a little beyond the second on posterior wing, and becoming confluent and terminating with that fascia beneath the median nervure; the fifth is wide and darkest, crossing both wings at cellular apices, and terminating a little beneath second median nervule; the sixth is widest, somewhat paler, with darker margins, outwardly sinuate and placed a little beyond the fifth; this sixth fascia is followed by three narrow fasciæ, which terminate on the abdominal

margin of the posterior wings, one being marginal and two submarginal, the middle one darkest and the inner one palest. The posterior wings possess two large submarginal ocellated spots, which are ochraceous, speckled with fuscous, possessing white centres and black outer margins, the inner borders of which are narrowly ochraceous; the lower and larger spot has the white centre somewhat lunate, and is followed posteriorly by a broad blackish suffusion; the upper of these spots is situated between the subcostal nervules, and the lower one between the second and third median nervules. The anal-angular prolongation of the posterior wings is spotted as above and has a large central castaneous suffusion. Body and legs more or less concolorous with wings.

The male possesses four long, curved tufts of hair on each side of the terminal segments of the abdomen. A somewhat similar tuft is situated about the centre of the abdominal margin to the posterior wings, on the inner side of the submedian nervure; and between the submedian nervure and third median nervure within a fold of the wing are also a few long hairs. Both of these, judging by analogous reasoning, are probably the coverings of scent-glands or pouches.

Female. Larger than the male; wings above paler, with an ochraceous discal fascia crossing both wings, widest near costa of anterior wings, and very narrow on posterior wings; the submarginal fasciæ as in male, but concolorous with the ochraceous margins. Wings beneath as in male, but much paler.

Exp. wings, ♂ 96 to 101 millim.; ♀ 108 to 112 millim.

HAB.—Andaman Islands (colls. Moore and Cale. Mus.)—Tenasserim; Meetan (Limborg).—Malay Peninsula; Penang; Province Wellesley (colls. Dist. and Sauer); Malacca (Brit. Mus.)—Sumatra (coll. Moore).—Billiton (coll. Godm. & Salv.)—Java (Horsf. Coll. Brit. Mus.)—Borneo (coll. Godm. & Salv.); Banjarmasin (coll. Dist.)—Celebes (Snellin).—Siam; Chentaboon (coll. Godm. & Salv.)

This species varies in the depth and intensity of hue possessed by the fuscous fasciæ on the under surfaces of the wings, as exhibited in the male and female forms here figured, and which may be taken as typical of the varietal extremes.

It is also of crepuscular flight. In Java and Celebes, according to Piepers, "the sun has scarcely set before we see everywhere" this and a few other species of like habits; but the same author remarks, "I never saw these species wandering about at night in the moonlight, or entering lighted rooms, like the true night-moths, which are very numerous, although, like the latter, they sit still and repose all day, and if disturbed only fly a little way and settle again directly."\* Mr. Collingwood speaks of these butterflies in the Bornean island, Labuan, as making "their appearance near sunset, when, from their large size, they might be almost mistaken for small bats."† In the Malay Peninsula *A. philippus* possesses the local name of "cocoa-nut moth," and, as Mr. Bigg writes, "it delights in shady places, and is especially found about attap-sheds and on dead cocoa-nut leaves."‡ The dull coloration of this species especially assimilates it to such an environment, and affords a very fair example of what is understood by "protective resemblance," or, as it might also be expressed, assimilative coloration.§

\* Tijds. Ent. xix. pp. xviii. to xxiv., and English translation by Kirby, 'Entomologist,' x. p. 271.

† 'Rambles of a Naturalist,' p. 183.

‡ Month. Packet, vol. ii. p. 191 (1881).

§ Although the theory of "protective resemblance" in animal life owes its elucidation to the labours and insight of Wallace and Darwin, it, like other similar facts, had not escaped the attention of the older naturalists of teleological tendencies. Thus St. Pierre ('Studies of Nature,' Hunter's transl. vol. ii. p. 175, 1809) relates:—"In the month of March last I observed, by the brink of the rivulet which washes the Gobelius, a butterfly (moth?) of the colour of brick, reposing with expanded wings on a tuft of grass. On my approaching him he flew off. He alighted at some paces distance on the ground, which at that place was of the same colour with himself. I approached him a second time; he took a second flight, and perched again on a similar stripe of earth. In a word, I found it was not in my power to oblige him to alight on the grass, though I made frequent attempts to that effect, and though the spaces of earth which separated the turfy soil were narrow and few in number." My late friend D. G. Rutherford recorded somewhat similar habits in an African butterfly, *Aterica mcleagris*, the colour of whose wings beneath, when at rest, so assimilated with the colour of the soil on which it settled as to make its detection a matter of the greatest difficulty (Proc. Ent. Soc. 1878, p. xlii); and Mr. Jenner Weir has exhibited specimens of *Hipparchia semele* which also showed a tendency to vary beneath in accordance with the nature of the soil in the different districts in which they had been found (*ibid.* p. xlix).

The larva (fig. 18) is from a drawing made in Java by Dr. Horsfield, who states that it there "feeds on the young leaves of *Coccos nucifera*, from December to April."\*

### Genus ZEUXIDIA.

*Zeuxidia*, Hübner, Samml. Ex. Schmett. (1816-1824); Westw. Gen. Diurn. Lep. p. 327 (1851).

Anterior wings subtriangular, with the costal margin strongly arched, and the apex acute, the inner margin in the male dilated and convex. First subcostal nervule emitted before the end of cell at about three-fourths its distance from base, anastomosing with costal nervure for some little distance and then reflexed to costa; † the second emitted near end of costal nervure; remaining subcostal nervules emitted near apex. Disco-cellular nervules generally as in *Amathusia*, and discoidal nervules well separated at their bases, as in that genus. First median nervule strongly angulated at base, as in *Amathusia*, but throwing off a short, oblique and disconnected nervule directed upwards, but not reaching the lower discoidal nervule, and connected with a fold in the wing, which gives the appearance of a fourth median nervule. Posterior wings subtriangular; costal margin strongly curved and convex; cell partly closed, as in *Amathusia*; anal angle attenuated and produced into a caudate prolongation between the third median nervule and the submedian nervure. In male specimens this wing possesses two large and prominent glands or pouches (probably scent-secreting), both of which possess a central tuft of hairs, one situate between the costal nervure and first subcostal nervule, ‡ the second in discoidal cell. There is also a smaller tuft covering an apparently small glandular pouch in the neighbourhood and near base of the submedian nervure.

The area of this genus is limited, and corresponds generally with that of *Amathusia*. It comprises eight or nine species, one of which is at present alone known in this fauna.

#### 1. *Zeuxidia amethystus*. (Tab. VII., fig. 1 ♂, 2 ♀.)

*Zeuxidia amethystus*, Butler, Proc. Zool. Soc. 1865, p. 485, n. 5; Trans. Linn. Soc., Zool., ser. 2, vol. i. p. 538, n. 1 (1877).

*Zeuxidia Wallacei*, Feld. Reise Nov. Lep. iii. p. 461, n. 777, t. 62, f. 3 (1866); Druce, Proc. Zool. Soc. 1873, p. 341, n. 2.

Male. Anterior wings rich chocolate-brown, crossed by a large bluish subapical fascia, with purplish reflections; this fascia commences at costal margin, where it is broadest, and terminates near apex of third median nervule, where it is narrowest; it is outwardly convex and inwardly (where it crosses about the end of cell) irregularly concave. Marginal fringe narrowly pale bluish white. Posterior wings rich chocolate-brown, with a large bluish anal-angular patch with purplish reflections; this patch extends upwards, and somewhat convexly, from anal angle, and terminates near first median nervule; anal-angular caudate prolongation distinctly marked with white on each side, and marginal fringe narrowly pale bluish white. Wings beneath pale brownish. Anterior wings with four irregular brown fasciæ crossing cell, which are continued on posterior wing and terminate at the median nervule; both are also crossed by a slightly waved fascia, the outer margin of which is distinctly darkest, commencing at costa of anterior wings, crossing cellular apices of both wings, and terminating very obscurely near the submedian nervure; both wings have a very much waved and sinuated narrow brown fascia between apex of cell and margin,

\* Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 210.

† I am somewhat at variance with Prof. Westwood in the diagnosis of this nervule. That excellent authority (Gen. Diurn. Lep. p. 328) has described "two slender oblique veinlets" connecting the costal nervure with the costa. The second of these is present, exactly as described by Westwood in one male specimen of *Z. amethystus* in my own collection, but as it is absent in other specimens of the same species, and also generally throughout the genus, I look upon it as an aberration only. The first veinlet I also consider as but the termination of the first subcostal nervule, after some lateral anastomosis with the costal nervure.

‡ Fritz Müller considers the dilatation and prolongation of the inner margin of the anterior wing over the costal area of the posterior wing "a never-failing indication of the presence of a scent-secreting organ" at that spot ('Kosmos,' Jan. 1897, p. 285 *et seq.*, and Abstr. by Meldola, 'Nature,' vol. xix. p. 587).

followed by two more obscure and much straighter fasciæ, one submarginal and the other marginal. Posterior wings with three ocellated spots with white centres and whitish and black margins, the upper and largest of which is situate between the subcostal nervules, the second and smallest is placed between the lower subcostal and discoidal nervules, and the third between the second and third median nervules. Both wings have also a few whitish suffusions, and the anterior wings are shaded with dark brown beyond the apex of the cell, and become more or less fuscous beneath the second median nervule; caudate prolongations marked with white on each side as above. The sexual tufts and margins of glands paler than wing.

Body and legs more or less concolorous with wings.

Female. Wings above pale brownish. Anterior wings becoming chocolate-brown beyond apex of cell, and there possessing the following pale stramineous markings:—a wavy fascia commencing on costal margin a little beyond cell and terminating above first median nervule, where it is outwardly followed by a small spot: beneath are six spots placed three above and three beneath the second median nervule; and near apex there is also an indication of a pale spot. Posterior wings with the outer marginal area more or less ochraceous, on which is a submarginal wavy and broken dark chocolate fascia, becoming in some specimens (as the one figured) obsolete towards anal angle; on inner side of this ochraceous area is an ill-defined darker apical patch or suffusion, on which are three pale ochraceous spots, two above and one beneath the discoidal nervule: there is also a similar but much fainter spot beneath the first median nervule (in one Malaccan specimen now before me these spots are nearly obsolete); anal caudate prolongation marked with white on each side. Wings beneath generally as in male, but the smaller ocellated spot on posterior wings in male absent, and the whitish suffusion more distinct.

Exp. wings, ♂ 90 to 96 millim.; ♀ 110 to 120 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Saüer); Malacca (Brit. Mus.)—Sumatra (Brit. Mus.)—Borneo (coll. Godm. & Salv.).

*Z. amethystus* does not probably extend north of the Malay Peninsula, as here faunistically treated, as from Tenasserim a closely allied species has been described.\* Considerable variation in depth of coloration is observable both above and beneath amongst male specimens.

This species affords a striking example of sexual dissimilarity in coloration and markings, in explanation of which several theories have been advanced, which are at least suggestive, if not conclusive. As in this case, where dissimilarity exists, it is usually, though not invariably, the male which is the most showy and brightly coloured, and Mr. Darwin considers that this is due to “sexual selection,” or, in other words, “the females for many generations having chosen and paired with the more attractive males,” † and certainly much of the argument which he applies to the sexes of the American genus *Epicallia* will apply to *Zeuzidia*. It is probable, at least on this view, that the female form represents more or less the ancestral type of the genus, for not only are all the female forms of *Zeuzidia* with which I am acquainted coloured in this manner, but similar sexual forms occur in the American genus *Morpho*, of which a striking example is the *Papilio marcus* of Schaller, which, judging from the somewhat indifferent figure, Mr. Kirby quite reasonably placed in the genus *Zeuzidia*, but which, by the acquisition of a Guianan specimen, I was subsequently enabled to show was the female sex of *Morpho adonis*, ‡ and almost simultaneously Mon. C. Oberthür figured the closely allied female sex of *Morpho eugenia*. § We have already alluded to the natural affinities of these genera, and the geological evidences which minimise their present geographical estrangement, and when we observe that in each

\* *Z. masoni*, Moore.

† ‘Descent of Man,’ 2nd edit. p. 318.

‡ Trans. Ent. Soc. 1881, p. 397.

§ ‘Etudes d’entomologie,’ liv. 6me, t. vi. f. 1.

case the male character depends upon the colour blue for its brilliancy, the remarkable affinity of these female forms of *Morpho* and *Zeuzidia* are most suggestive. If we allowed ourselves to generalise, it would seem that in *Morpho* and Tropical America the brilliant blue character of the male has reached its maximum, and has there descended in the majority of instances to the female as a secondary sexual character, whilst in *Zeuzidia* the females still retain their primitive coloration.

Mr. Wallace, however, rejects the theory of sexual selection, and substitutes several propositions to account for varying sexual phenomena. One of the principal of these is the "need of protection, repressing in the female those bright colours which are normally produced in both sexes by general laws."\* The observation of the habits of both sexes of *Zeuzidia* would greatly assist this theory. Mr. Wallace has also proposed "Colour as a means of Recognition" for butterflies, "in which the females of closely-allied species in the same locality sometimes differ considerably, while the males are much alike."† This, however, would not apply to *Z. amethystus*, as it possesses a close ally in the female of *Z. doubledayi*.‡

#### Genus DISCOPHORA.

*Discophora*, Boisduval, Sp. Gén. i. t. 12, f. 3 (1836); Westw. Gen. Diurn. Lep. p. 329 (1851); Moore, Lep. Ceyl. i. p. 35 (1881).

Anterior wings subtriangular, with the costal margin very much arched and the apex acute; the inner margin nearly straight. First subcostal nervule emitted a little before the end of cell, anastomosing with costal nervule for some little distance, and then apparently reflexed to costa; the second pursuing a like course a little before apex of costal nervule; remaining nervules emitted beyond costal nervule and near apex. Discoidal nervules with their bases contiguous. First median nervule slightly arched, but not angulated beyond apex of cell. Posterior wings subtriangular; disk of costal margin nearly straight; outer margin of wings, especially in the female, more or less prominently and obtusely angulated at apex of first median nervule. Discoidal cell quite unclosed at apex.

The males possess a silky oval patch of raised scales on the upper surface of the posterior wings at the bases of the median nervules.

This genus comprises some eight or nine species, spread over an area which in the main corresponds with that of the two preceding genera. *Discophora* is found in Continental India, Ceylon, Andaman Islands, Burma, Tenasserim, the Malay Peninsula, and onwards throughout a large portion of the Malayan Archipelago.

Two species are at present included in this fauna.

#### 1. *Discophora tullia*. (Tab. VII., fig. 8 ♂, 9 ♀.)

*Papilio Tullia*, Cramer, Pap. Ex. i. t. 81, A, B (1779); Fabr. Sp. Ins. p. 76, n. 337 (1781); Mant. Ins. p. 38, n. 394 (1787); Ent. Syst. iii. p. 98, n. 305 (1793).

*Morpho Tullia*, Godt. Enc. Méth. ix. p. 446, n. 19 (1823).

*Discophora tullia*, Westw. Gen. Diurn. Lep. p. 331, n. 1 (1851); Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 211, n. 431 (1857); Moore, Proc. Zool. Soc. 1865, p. 767; *ibid.* 1878, p. 826; Butl. Cat. Fabr. Lep. p. 45, n. 1 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 538, n. 2 (1877); Druce, Proc. Zool. Soc. 1878, p. 341, n. 1.

\* 'Tropical Nature,' p. 193.

† *Ibid.* p. 196.

‡ The subject has also been treated by Fritz Müller ('Kosmos,' 1879, p. 285 *et seq.*), with reference to an American butterfly, but his views do not apply to our present discussion.



Male. Wings above fuliginous-brown; posterior wings with a silky patch of raised scales at bases of median nervules.

NOTE.—In all male specimens as yet examined from the Malay Peninsula the anterior wings are unspotted, but in specimens from Continental India there are usually three discal rows of pale spots between the end of cell and outer margin. The ground colour also varies in intensity of hue.

Wings beneath dull ochraceous; basal half of both wings dark ochraceous, remaining outer portions pale ochraceous, with three more or less waved darker fasciæ, one marginal and two submarginal; posterior wings with two ocellated spots with white centres and white and black margins, the first situate between the subcostal nervules, the second between the second and third median nervules (this lower second spot is absent in the specimen figured). Body and legs more or less concolorous with wings.

Female. Wings above pale chocolate-brown. Anterior wings with the outer discal portion dark chocolate-brown; an obscure ochraceous spot in and before end of cell, and a smaller but more distinct spot of the same colour beyond end of cell; a like spot beneath cell and between second and third median nervules (absent in specimen figured): an inner discal series of six white spots placed between the nervules, the largest, upper, and innermost two contiguous, and separated by the upper discoidal nervule; the sixth, with its posterior margin tinged with ochraceous, is situate between the third median nervule and submedian nervule; this is outwardly followed by a series of five spots, the upper one bluish and amalgamating with the second inner spot, second and third bluish, and fourth and fifth ochraceous; and a submarginal row of five ochraceous spots placed between the nervules in a line with the other two series; costal and outer margins very pale brownish. Posterior wings with the outer discal portion dark chocolate-brown, and with three discal series of ochraceous spots placed between the nervules, the two inner series not passing the third median nervule, the outer series having an indistinct spot beyond that nervule; the intermediate series are more or less distinctly sublunate, and the outer series are inwardly margined with very dark chocolate-brown; outer margin very pale brownish. Wings beneath as in male, but paler, the basal portion with a few scattered dark rounded spots near base; a waved, continuous, narrow dark fascia crossing the centres of both cells, and a dark spot at the upper disco-cellular nervule of anterior wings; ocellated spots to posterior wings smaller than in male, but varying in size.

Long. ♂ 70 to 75 millim.; ♀ 90 to 98 millim.

HAB.—Continental India; Darjeeling (Horsf. & Moore); Silhet (Brit. Mus.)—Tenasserim; near Ahsown (Limborg).—Malay Peninsula; Province Wellesley (colls. Dist. & Sauer); Malacca (Brit. Mus.)—Borneo (coll. Godm. & Salv.).

The females of this species vary in the prominence of the apical angles of the anterior wings, thus approximating towards the specimens described by Prof. Westwood as a distinct species, under the name of *Discophora Zal*, but which may probably prove to be merely a variety of this species.\*

The larva is figured in Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. (pl. xii. fig. 15), from the original drawing made by Mr. A. Grote, then of Calcutta, and is stated to feed on "*Bambusa*." It apparently agrees in structure with the larva of *D. celinde*, which is here figured.

## 2. *Discophora celinde*. (Tab. V., fig. 10 ♂, 11 ♀.)

*Papilio Celinde*, Stoll, Suppl. Cram. Pap. Ex. t. 37, f. 1, 1 A (1790).

*Papilio Menetho*, Fabr. Ent. Syst. iii. 1, p. 83, n. 260 (1793); Donov. Ins. Ind. t. 30, f. 1 (1800).

*Papilio aristides*, Fabr. Ent. Syst. iii. 1, p. 86, n. 268 (1793).

\* Mr. Moore has enumerated *Discophora Zal* among the Tenasserim butterflies (Proc. Zool. Soc. 1878, p. 826); and Mr. Kirby, in that lepidopterists' *vade mecum*, his 'Cat. Diurn. Lep.' p. 646, also considers it distinct.

*Morpho Celinde*, Godt. Enc. Méth. ix. p. 446, n. 18 (1823); Horsf. Cat. Lep. E. I. C. t. 6, f. 6 (1829).

*Morpho Menetho*, Godt. Enc. Meth. ix. p. 446, n. 20 (1823).

*Discophora celinde*, Herr.-Schaff. Ex. Schmett. f. 5, 6 (1850); Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 211, n. 432 (1857); Snellen, Tijd. Ent. xix. p. 148, n. 22 (1876); Moore, Proc. Zool. Soc. 1877, p. 583; Wood-Mas. & de Nicév. Journ. As. Soc. Bengl. xlix. p. 226, n. 10 (1880).

*Discophora menetho*, Butl. Cat. Fabr. Lep. p. 45, n. 2 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 538, n. 1 (1877).

Male. Wings above olivaceous, with obscure bluish reflections. Anterior wings with the following ochraceous spots:—one linear beyond end of cell and between the discoidal nervules, followed by three which are divided by the discoidal nervules (the upper of which is more frequently absent), and a submarginal series of which the uppermost is situate between the discoidal nervules, and the lower one between the third median nervule and the submedian nervure. Posterior wings with a piceous, subovate, silky patch of raised scales at basal area of median nervules, the outer margin of which is pale brownish. Wings beneath reddish ochraceous, mottled with numerous dark strigæ, and crossed by a distinct broad darker oblique fascia, passing at about cellular apices of both wings, which have also two narrow submarginal waved fasciæ, at the area of which (especially on anterior wings) the colour is paler, and between which and the oblique fascia the colour is darkest. Anterior wings with three waved and sinuated fasciæ crossing cell. Posterior wings with two discal ocellated spots, with white centres and yellow and black margins, the first of which is situate between the subcostal nervules, and the second and smallest between the second and third median nervules. Body and legs more or less concolorous with wings. Antennæ brownish above and pale ochraceous beneath.

Female. Wings above pale chocolate-brown. Anterior wings becoming darker towards apical area, where they are crossed by a very broad ochraceous subapical fascia, which commencing at costa passes a little beyond end of cell, is outwardly widened beneath the lower discoidal nervule, to near margin, and is inwardly narrowed between the first and second median nervules till it terminates between the third median nervule and submedian nervure; this fascia is preceded by a small ochraceous spot between the second and third median nervules, and is followed by a narrow outer marginal ochraceous fascia. Posterior wings with an outer marginal ochraceous fascia, which beyond the discoidal nervule towards anal angle is only represented by a few spots between the nervules; a submarginal series of four ochraceous spots placed between nervules, and two discal spots divided by the lower subcostal nervule. Wings beneath as in male, but much paler, and with the fasciæ much less distinctly defined.

Exp. wings, ♂ 85 to 93 millim.; ♀ 100 millim.

HAB.—Continental India; Darjeeling\* (Horsf. & Moore, and coll. Dist.); Nepaul (Brit. Mus.)—Andaman Islands (colls. Moore and Calc. Mus.)—Malay Peninsula; Province Wellesley (colls. Dist. and Säuer); Malacca (Brit. Mus.)—Java (coll. Horsf.)—Borneo (coll. Dist.)

The above descriptions apply to the form of the species as found in the Malay Peninsula. That of the male agrees with the figures of Stoll and Herrich-Schäffer, and is widely distributed, a Darjeeling specimen in my own collection being in no way different. But in some Malayan specimens the spots on the anterior wings are almost white, and the upper two of the three discal spots are obliterated. As the males agree with the typical form as figured by Stoll, and also with the male specimens arranged as *D. celinde* in the British Museum, I cannot agree with Mr. Butler, who has placed a Malaccan female specimen, generally agreeing with the one

\* This is an unsatisfactory habitat. Mr. H. J. Elwes (Ann. & Mag. Nat. Hist. ser. 5, vol. vii. p. 468) has pointed out that it is the central station and only town in Brit. Sikkim, and being the centre to which all native collectors bring their specimens for disposal, species found in Brit. and Native Sikkim, and the adjoining parts of Bhotan, Tibet, and Nepaul, from the level of the plains up to 18,000 or 19,000 feet, are thus labelled "Darjeeling." The Neotropical habitat "Bogota" has been shown to be equally unsatisfactory, if not often fallacious (see Birchall, 'Zoologist,' p. 9512).

here figured, with a Nepalese male\* to represent the *D. menetho*, Fabr., as a distinct species, especially as the Fabrician type is not contained in the British Museum. Moreover, the same author † has given Donovan's figure as agreeing with the *D. menetho*, Fabr., but this is unlike the female Malaccan form, and if such wide variation is allowed (as appears only reasonable and just) it is difficult to understand how the distinction of the two proposed species can be maintained.

The larva is figured by Horsfield (*ante*, p. 67, fig. 19), and is described as feeding, in Java, on the young leaves of *Cocos nucifera* from December to January. ‡ This is the larval food-plant, according to the same authority, of *Amathusia phidippus*.

### Genus THAUMANTIS.

*Thaumantis*, Hübner, Samml. Ex. Schmett. (1816—1824); Blanch. Hist. Nat. Ins. iii. p. 455 (1840); Westw. Gen. Diurn. Lep. p. 335 (1851); Trans. Ent. Soc. ser. 2, vol. iv. p. 170 (1858).

Anterior wings subtriangular; costal margin very much arched, the apex more or less rounded, the inner margin nearly straight. First subcostal nervule emitted a little before the end of the cell, anastomosing with the costal nervule for some distance, and then apparently reflexed to costa; the second pursuing a like course a little before apex of costal nervule; remaining nervules emitted before or near apex of costal nervule. Discoidal nervules well separated at their origin. First median nervule strongly arched, but not angulated beyond apex of cell. Posterior wings more or less ovate, the anal angle sometimes moderately produced; disk of costal margin nearly straight. First median nervule strongly arched and angulated towards discoidal nervule. Discoidal cell with the apex quite unclosed.

*Thaumantis* is a genus which is found in Continental India, Tenasserim, the Indo-Malayan Region, Siam, and as far north as Shanghai, and comprises at the present time about a dozen described species. Allusion has already been made to its striking genetic affinity with the American genus *Morpho*, and, as in that genus, *Thaumantis* also possesses two typical forms of coloration, which may roughly be described as the blue and the tawny types.

A good example of the blue species of *Thaumantis* is afforded by *T. lucipor* (Tab. IX. f. 8 & 9), which approximates towards the predominating facies of *Morpho*, while *T. pseudaliris* (Tab. VIII. f. 3) and *T. louisa* (a Tenasserim species) reflect more or less faithfully the features of that portion of the genus *Morpho* which is represented by *M. metellus* and allies.

Three species only have, as yet, been received from the Malay Peninsula. §

#### 1. *Thaumantis lucipor*. (Tab. IX., fig. 8 ♂, 9 ♀.)

*Thaumantis Lucipor*, Westwood, Gen. Diurn. Lep. p. 337, n. 5, *note* (1851); Trans. Ent. Soc. ser. 2, vol. iv. p. 173, n. 5, t. 19 (1858); Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 215, n. 443 (1857); Druce, Proc. Zool. Soc. 1873, p. 341, n. 2.

Male. Wings above pale chocolate-brown, the disks of both wings darker, and with dark and resplendent bluish reflections, which do not extend to the costal area and wide outer margin (diminishing from apex) of

\* I possess a male from Borneo which greatly resembles this specimen.

† Cat. Fabr. Lep. p. 45, n. 2.

‡ Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 212.

§ In the 'Cat. of Diurn. Lepid. formed by W. C. Hewitson,' p. 108 (1879), *T. aliris*, Westw., is stated to have been received from Malacca. This, however, from examination, proves to be an erroneous habitat, as the Malaccan specimens represent the *T. pseudaliris*, Butl., which is here described. Although Mr. Kirby compiled the catalogue he is in no way answerable for the identifications, having followed those of Hewitson throughout.

the anterior wings, nor to the abdominal or outer margin of the posterior wings. Wings beneath chocolate-brown, with the outer margins of both wings broadly and distinctly paler. Anterior wings with three very indistinct and irregular pale fasciæ crossing cell; an oblique distinct pale fascia commencing about costal nervule a little beyond apex of cell, and terminating about third median nervule near the pale outer margin, which possesses a submedial and much waved darker line, on inner side of which the colour is much suffused with greyish; beneath the third median nervule the colour is pale brownish. Posterior wings with the basal area much suffused with greyish, on which is a large, irregular and curved fascia, which is broadest on costal margin and narrowest at its termination near the submedial nervule. At the boundary of the pale outer margin the colour is much darker, and between the third median nervule and submedial nervule appears as a suddenly bent and reflexed fascia; this area contains two ocellated spots, the first and uppermost of which, situate between the subcostal nervules, is dark with slightly paler margin, and its inner third white; the lower is situate between the second and third median nervules, and has its inner margin white. The outer pale margin possesses a submedial and much-waved darker line, on inner side of which the colour is much suffused with greyish, and between the third median nervule and submedial nervule is an oblong black spot with an outer white continuation. Body and legs more or less concolorous with wings.

The male possesses two basal patches of pale hairs\* near costal base of upper surface of posterior wings, which probably denote scent-secretory organs.

Female. Larger and with the wings above slightly paler than in male, with similar blue reflections as in that sex, but which do not extend beyond the basal halves of both wings. Anterior wings with the blue reflection outwardly bounded by a more or less distinct pale oblique but broken fascia, commencing above the first discoidal nervule and terminating near the third median nervule; two small subapical ochraceous spots on each side of fifth subcostal nervule, followed by a much-waved and sinuated submarginal ochraceous fascia, commencing near first discoidal nervule and terminating near outer angle. Posterior wings with a much-waved and sinuated fuscous submarginal fascia, commencing near apex of first subcostal nervule and terminating near anal angle; between the subcostal nervules this fascia is outwardly bordered by a pale ochraceous marginal spot. Wings beneath somewhat paler and brighter than in male, excepting the dark shadings, which are as intense as in that sex; the posterior wings are crossed by a narrow undulating dark fascia, commencing near costa, crossing near apex of cell, and terminating at third median nervule (this is faintly discernible in male); the submedial waved fasciæ to pale outer margins of wings are also very distinct.

Exp. wings, ♂ 87 to 94 millim.; ♀ 98 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Sauer).—Borneo (colls. Dist. and Godm. & Salv.); Sarawak (Brit. Mus.)

This beautiful species has been hitherto only known in collections as from Borneo; it is, however, contained in Mr. Sauer's collection, which was formed in Province Wellesley.

### 3. *Thaumantis noureddin*. (Tab. VII., fig. 3 ♂; and Tab. IX., fig. 7 ♀.)

*Thaumantis Noureddin*, Westwood, Gen. Diurn. Lep. p. 337, n. 6, note (1851); Trans. Ent. Soc. ser. 2, vol. iv. p. 175, n. 6, t. 20 (1858); Horsf. & Moore, Cat. Lep. Mus. E. I. C. p. 215, n. 444 (1857); Druce, Proc. Zool. Soc. (1873), p. 341, n. 3; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 538, n. 1 (1877).

Male. Wings above dark fuscous-brown; the outer margins of both wings broadly paler. Anterior wings with the pale outer margin much waved inwardly, and there denoted by a row of more or less distinct whitish spots placed upon the nervules; the costal area and basal portion of cell also somewhat paler. The posterior wings have the paler outer portion much less well defined, broadest at anal angle,

\* These in the typical specimen were described as black by Prof. Westwood, and therefore probably vary in hue.

and terminating on abdominal margin. Wings beneath pale castaneous; both wings crossed by an almost straight submarginal dark castaneous fascia, bordered outwardly with greyish. Anterior wings with a pale waved fascia crossing cell near its centre; a narrow oblique greyish fascia beyond cell, commencing near costal nervure, and terminating at first median nervule, beyond which it is continued and indicated by a narrow dark line only; between these pale fasciæ the colour is somewhat darker, and is thus continued in a waved and narrower form on posterior wings, where it terminates in a faint and indistinct manner about centre of abdominal margin. Posterior wings with two ocellated spots on inner side of submarginal fascia; these spots are inwardly margined with white, and are situate one between the subcostal nervules, and one between the second and third median nervules; apical angle with a fuscous spot, bordered on each side with greyish.\*

The male is provided with two tufts of long dark hairs near base of upper surface of posterior wings, covering the disks of two distinct pseudo scent-glands or pouches.

Female. Larger than male; wings above with distinct basal resplendent bluish reflections. Anterior wings with a discal, curved, and outwardly convex series of five ochraceous spots placed between the nervules, commencing between the discoidal nervules, and terminating near the third median nervule, and a straight submarginal series of five ochraceous spots also placed between the nervules. Posterior wings with a waved fuscous marginal fascia. Wings beneath slightly paler than in male, the oblique greyish fascia beyond cell of anterior wings much more distinct, broader, and continuous, the straight submarginal fascia to both wings outwardly much more widely bordered with greyish; ocellated spots larger and anal angle less produced than in male.

Exp. wings, ♂ 93 millim.; ♀ 94 to 98 millim.

HAB.—Malay Peninsula; Province Wellesley (colls. Dist. and Sauter); Malacca (Brit. Mus.)—Borneo (coll. Godm. & Salv.)

The males of this species vary in the amount of melanism. In some specimens, as the one figured, the submarginal series of pale spots above are scarcely visible.

### 3. *Thaumantis pseudaliris*. (Tab. VIII., fig. 3 ♂.)

*Thaumantis pseudaliris*, Butler, Journ. Linn. Soc., Zool. vol. xiii. p. 115 (1877); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 538, n. 2, t. lxxviii. fig. 1 (1877).

*Thaumantis aliris*, ♂, Westw. Trans. Ent. Soc. ser. 2, vol. iv. p. 176 (1858).†

Male. Anterior wings above fuscous-brown, with the base ferruginous, crossed by a pale lemon-coloured transverse undulating fascia, which, commencing at costa above apex of cell, is then slightly curved outwardly, passing a little beyond cell, is gradually narrowed between second and third median nervules, and terminates in a small spot beneath the last-named nervule; two large subapical white spots, separated by the upper discoidal nervule. Posterior wings fuscous-brown, with the base ferruginous; the apical half from a little beyond the median nervule, and a large subquadrate apical-angular spot ochraceous, more or less tinged with orange-red. Wings beneath crossed by a broad, irregular, and deeply sinuated chocolate fascia; on anterior wings this fascia is abbreviated about median nervule, and is very narrow at costal margin, where it is supplanted by the commencement of a transverse waved white fascia crossing wing at end of cell and terminating on outer margin at apex of third median nervule; on the inner side of the chocolate fascia the colour is obscure ochraceous, with two irregular reddish spots in cell and a smaller one above it; beyond the white fascia the colour is reddish ochraceous, with a large discal obscure violaceous patch, bordered outwards with fuscous, and containing an outer white spot above upper discoidal

\* These anal-angular markings have been unfortunately omitted from the figure.

† Mr. Butler in renaming the male of Westwood's species has accidentally given a wrong reference to that author's description.

nervule; beneath the median nervule the white fascia is inwardly and irregularly bordered with fuscous. On posterior wings the chocolate fascia is broadest on costal margin, strongly angulated and narrowed about discoidal nervule, outwardly angulated and rounded at base of first median nervule, and terminating at anal angle between the third median nervule and submedian nervule where it is narrowest; it is outwardly margined with white for its upper half; the inner area is pale obscure ochraceous, with three reddish spots, two irregular and linear situated above and beneath cell, and one small and rounded in and near base of cell; outer area reddish ochraceous, with two ocellated spots, the upper one mottled with reddish and with a white centre and black margin situate between the subcostal nervules, the lower and larger one with a large black spot inwardly bordered with white near its inner margin; outer margin black inwardly preceded with pale ochraceous; this spot is situated between the second and third median nervules; and a small linear marginal black spot between the third median nervule and the submedian nervule.

Male with two large basal tufts of hair on upper surface of lower wings, the smaller near costa, the larger at base of cell.

Female. Somewhat larger than the male; apical angle of anterior wings tinged with dark bluish, beneath paler, brighter and more violaceous.

Exp. wings, ♂ 111 millim.; ♀ 114 millim.

HAB.—Tenasserim; Thoungyeen Valley, foot of Donat Range (Bingham, Brit. Mus.)—Malay Peninsula; Malacca (Pinwill, Brit. Mus., and coll. Hewits.).

The male specimen in the British Museum is here figured, and was captured in Malacca; the female to which reference is made was collected by Capt. Bingham in Tenasserim. The first is somewhat worn, and it is possible that in fresh specimens the apical area of the upper surface of the anterior wing is bluish, as described in the female specimen.

Prof. Westwood, when he described his *T. aliris*, apparently possessed the sexes of two species, and as he figured the female of the Bornean species, which is distinct, it was necessary to rename the Malaccan male.

#### Genus CLEROME.

*Clerome*, Westwood, Gen. Diurn. Lep. p. 333 (1851); Trans. Ent. Soc. ser. 2, vol. iv. p. 182 (1858).

Anterior wings subtriangular or subovate; costal margin very much arched, the apex rounded; outer margin more or less convex; in the male the inner margin slightly dilated at base. First subcostal nervule emitted a little before end of cell, and terminating beyond apex of costal nervule; second, third, and fourth subcostal nervules emitted somewhat close together, the second before the apex of the first; fourth and fifth with a common origin. Lower disco-cellular nervule very long and obliquely sinuate. Discoidal nervules distinctly separated at their origin. First median nervule not prominently arched or angulated at base. Posterior wings ovate; disk of costal margin nearly straight; outer margin and anal angle rounded. Discoidal nervule (the base of which is homologous to an upper disco-cellular nervule) emitted close to the bifurcation of the subcostal nervules. Discoidal cell with the apex quite inclosed.

The geographical area of *Clerome* pertains to that of the previously enumerated Malayan genera of *Morphina*. From Continental India in the west it extends eastwards through Tenasserim, the Malay Peninsula, a little beyond the confines of the Indo-Malayan portion of the Archipelago, and as far north as China.

About fourteen species are described, two alone of which have at present been received from this region; these, however, represent respectively the smallest and most beautiful species of the genus.

1. *Clerome gracilis*. (Tab. VIII., fig. 1 ♂.)

*Clerome gracilis*, Butler, Ann. & Mag. Nat. Hist. ser. 3, vol. xx. p. 401, t. 8, f. 7 (1867).

Male. Wings above brownish ochraceous; posterior wings with a somewhat faint discal ocellated spot, situate between the second and third median nervules. Wings beneath somewhat paler, and crossed by two waved narrow fuscous fasciæ; the first passing through the centres of both cells, and the second commencing about costal margin of anterior wings, passing beyond the cellular apices and terminating near the middle of abdominal margin to posterior wings; a submarginal and strongly sinuated narrow fuscous fascia to both wings. Between the central and submarginal fasciæ are placed the following spots:—on anterior wings a series of four small whitish spots placed between the nervules, the first above upper discoidal nervule, and the fourth beneath first median nervule, followed between the second and third median nervules by an ocellated spot, black, with a pale centre and ochraceous and black margins. Posterior wings with an ocellated spot between the subcostal nervules, followed by three whitish spots between the nervules, and an ocellated spot between the second and third median nervules. Body and legs more or less concolorous with wings.

Exp. wings, ♂ 53 millim.

HAB.—Malay Peninsula; Malacca (Brit. Mus.); Singapore (coll. Hewits.)—Borneo.\*

I have not seen the female of this species. The typical male specimen was collected in Malacca by Lieut. Roberts, and a specimen in the British Museum is here figured. It is one of the smallest species of the genus, and appears to be seldom found by collectors.

2. *Clerome faunula*. (Tab. VIII., fig. 2.)

*Clerome faunula*, Westwood, Gen. Diurn. Lep. p. 334, n. 3, note, t. 54, f. 1 (1851).

*Clerome (Melanoeyma) faunula*, Westw. Trans. Ent. Soc. ser. 2, vol. iv. p. 186, t. 21, f. 2 (1858).

Female. Wings above pale fuscous; posterior wings with the abdominal half beneath cell and to about second median nervule bright shining yellow. Anterior wings with the upper disco-cellular nervule very darkly infuscated and with the following dark markings:—a transverse streak across cell near apex, preceded by a rounded spot, beneath which are two other spots situate between the base of the third median nervule and the submedian nervule; two discal, transverse, strongly waved, and sinuated fasciæ, the first crossing wing a little beyond apex of cell, and the second being somewhat submarginal, and a very faint, waved, narrow, marginal fascia, which is obsolete towards apex. Posterior wings with the following dark markings:—an oblique fascia near base terminating about internal nervule; two very strongly waved and sinuated discal fasciæ, which become united at lower subcostal nervule, the inner one then crossing wing at apex of cell and terminating near centre of submedian nervule, the outer one somewhat submarginal and much less strongly waved and sinuated after passing first median nervule, till it terminates at submedian nervule; and a waved marginal fascia becoming obsolete towards anal angle. Wings beneath pale greyish, marked as above, but with the yellow coloration of the posterior wings richer and darker, and with all the fasciæ and spots very dark fuscous; costal area of the anterior wings pale fuscous. Body and legs more or less concolorous with wings.

Exp. wings, ♀ 98 millim.

HAB.—Malay Peninsula; Malacca, Mount Ophir (D. Wallace); Singapore (Brit. Mus.)—Cambodia (coll. Hewits.)

\* 'Cat. Diurn. Lep. formed by W. C. Hewitson,' p. 108.

This species appears to be somewhat rare in collections. The British Museum possesses one female specimen, which was captured at Singapore, and which is not only here figured, but is also the only one I have examined. Prof. Westwood\* records a second specimen as collected at Mount Ophir by Mr. D. Wallace; and a third, from Cambodia, is contained in the Hewitsonian collection.

This is not only a beautiful but also an aberrant species, it being quite destitute of ocellated spots, a character which Prof. Westwood was reasonably of opinion should warrant its subgeneric separation. The wings are also semidiaphanous, thus allowing the fasciæ beneath to be visible above.

### Genus XANTHOTÆNIA.

*Xanthotania*, Westwood, Trans. Ent. Soc. ser. 2, vol. iv. p. 187 (1858).

Anterior wings subtriangular, the costal margin moderately arched, the apex rounded, the outer margin moderately convex, the inner margin nearly straight. First subcostal nervule emitted a little before the end of cell, and terminating a little beyond costal nervure; second and third subcostal nervules emitted some little distance apart,† the second a little before the apex of the first, fourth emitted a short distance from the third, fourth and fifth with a common origin. Lower disco-cellular nervule very long and obliquely sinuate. Discoidal nervules well separated at their origin. First median nervule not prominently arched nor angulated at base. Posterior wings subovate and elongate, somewhat attenuated towards anal angle. Discoidal nervule (the base of which is homologous to an upper disco-cellular nervule) emitted some distance from the bifurcation of the subcostal nervules. Discoidal cell with the apex entirely open.

Only one species of this interesting genus is at present known, and which is here enumerated. The habitats of this species must therefore be taken as representing the geographical area of the genus.

#### 1. *Xanthotænia busiris*. (Tab. V., fig. 7.)

*Clerome (Xanthotania) Busiris*, Westwood, Trans. Ent. Soc. ser. 2, vol. iv. p. 187, n. 6 (1858).

*Clerome busiris*, Druce, Proc. Zool. Soc. 1873, p. 341, n. 4.

*Xanthotania busiris*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 538, n. 1 (1877); Moore, Proc. Zool. Soc. 1878, p. 827.

Male. Wings above reddish ochraceous; anterior wings with an oblique, pale ochraceous fascia crossing wings at end of cell, and terminating between second and third median nervules a little before outer margin; beyond and beneath the apex of this fascia the colour is dark chocolate-brown, of which the outer margin is paler; and with a pale whitish subapical spot situate above the upper discoidal nervule. Wings beneath much paler, but variable in intensity of hue. Anterior wings marked as above, but the subapical whitish spot having above a very small one of the same colour, and beneath an ocellated spot with a white centre and yellowish margin, situate between the discoidal nervules, and two small and obscure whitish spots, situate one on each side of the first median nervule. Discoidal cell crossed by a much-waved and angulated dark line. Posterior wings with two strongly waved and sinuated dark lines, enclosing a pale irregular fascia, commencing at costa a short distance from base, where it is narrowest, crossing

\* Trans. Ent. Soc. ser. 2, vol. iv. p. 186.

† Prof. Westwood states, "the third and fourth branches of the post-costal vein of the fore wings rise a moderate distance apart." This, however, appears to me to be the second and third.



apex of cell and terminating a little beyond submedian nervure; the outer marginal line is preceded at apex of cell with an inner marginal line, giving the appearance of a lower disco-cellular nervule; two submarginal waved dark lines and a narrow marginal one of the same colour; eight pale, rounded, and more or less ocellated discal spots, the first and second largest, contiguous, and subdivided by the first subcostal nervule, fourth and fifth divided by the first median nervule, smaller than third, which is situate above discoidal nervule, sixth large and placed between second and third median nervules, seventh and eighth small and together situate between third median nervule and submedian nervure; an obscure, narrow, dark fascia extends from the inner side of the two upper spots to near the fifth or sixth spots. Body and legs more or less concolorous with wings.

The male possesses a long tuft of fine hairs on the abdominal margin of the posterior wings, a little before the apex of abdomen.

Exp. wings, ♂ 65 to 72 millim.

HAB.—Tenasserim; Moolai, 3000—6000 ft. (Limborg, coll. Moore).—Malay Peninsula; Malacca (Pinwill, Brit. Mus.)—Sumatra (Forbes, coll. Dist.)—Java (coll. Dist.)—Borneo (coll. Hewits.).

The female of this species is contained in the British Museum, and resembles the male sex.



FIG. 25.—Head, showing palpi of *Cynthia deione*.

#### Group NYMPHALINA.

Palpi broad, the anterior margin more or less dilated.

Larvæ variable in form.

This group represents the subfam. *Nymphalinae* of many authors, and the reasons for this proposed arrangement have already been submitted when discussing the group *Morphina*, though it may be added that some recent authors, as Moore\* and Snellen, incorporate the two groups together. With some authorities, also, the subfam. *Acraeinae* is systematically arranged between the two groups. Of the *Acraeinae* no example has at the present time been either received from the Malay Peninsula, or recorded from that region; but as a species is found in Ceylon, and more particularly as another has been lately sent home by Mr. Forbes from Sumatra, it is quite possible that the *Acraeinae* will still prove to be represented in this fauna.

Amongst the *Nymphalina* there are probably several genera which remain to be discovered in the Malay Peninsula, but which are still absent from our lists and collections. Thus at the present time we have received no so-called "leaf-butterfly" belonging to the genus *Kallima*. As this well-known genus is found in Continental India, Ceylon, Andaman Islands, Burma, Tenasserim, Sumatra, and Java, it seems hardly reasonable to conclude that it is absent in what may be considered as the intervening district of the Malay Peninsula, as here faunistically understood. It seems difficult also to believe that no species of *Herona* inhabits the Peninsula, † as that genus is represented in Continental India, Andaman Islands, Tenasserim, and Sumatra. Of other Oriental genera not at present included in this fauna may be mentioned

\* Lep. Ceylon.

† There can be little doubt that when collections are made in the highlands of the interior and in the Native States many species will be added to this already rich Rhopalocerous fauna.

the following:—*Argynnis*, though a widely spread genus, of which a species (*A. niphe*) is recorded both from Ceylon and Sumatra; *Symbrenthia*, well represented in Continental India, and also received from Sumatra and Java; *Pyrameis*, of which the ubiquitous *P. cardui* may remain to be discovered; and *Apatura*, a very widely distributed genus, which, though absent from the Peninsula, is still somewhat represented by the closely allied genus *Eulacura*. The genus *Vanessa*, in the form of its species *V. C-aureum*, has been recorded from Penang by Mr. Kirby,\* probably on the strength of a specimen with that habitat attached, in the Dublin Museum, but having seen no other specimen of that species in any of the collections I have examined, and not having met with it myself when collecting on the spot, I have, pending corroborative testimony, not enumerated the genus here. With these exceptions the Oriental genera of the *Nymphalina* are well represented in the Malay Peninsula.

The characters on which I have relied for the separation of the *Nymphalina* from the *Morphina*, viz., the structure of the palpi, will I think be found generally to obtain, and to be of an easily recognisable nature. Much of the apparent dilatation of the anterior margin of the palpi is due to the presence of a thick clothing of long hairs, irregular in arrangement and structure, but still of sufficient constancy to render the dilated appearance of the palpi at the anterior margins uniformly and easily discernible.

Division would of course materially assist the study of this large group, especially if the whole, and not a small faunistic portion only, were being examined; but, beyond some general resemblances of form and colour, I have found little on which reliance could be placed for divisional separation, and have therefore endeavoured to supply a synopsis of the genera *en bloc*.† When the developmental characters of the *Nymphalina* are more fully worked out, natural divisions will probably be manifest; at present, though larval coincidences do exist in small divisions of genera, the structural characters of the perfect insects do not always agree in a like ratio. ‡

\* Cat. Diurn. Lep. p. 181, 1 (1871).

† Amongst others who have divided the subfam. *Nymphalinae*, and whose views will well repay study, may be mentioned Herrich-Schäffer (Corresp.-Blatt. Zool.-mineral. ver. Regensb. 1864—"Separat." pp. 16—40, where the whole of the then recorded genera are analyzed and grouped) and Burmeister (Descrip. Physiq. de la Republ. Argent., vol. v., pp. 130 *et seq.*, where a portion of the Neotropical fauna is alone treated).

‡ The uncertainty of the larval characters in this group, when taken as material for formulating sectional divisions, is well shown by a reference to the views of Horsfield, who made a diligent and thorough examination of these characters for systematic purposes. In his *Thysanuriform* group, as already pointed out (*ante*, p. 37), genera are there associated by larval characters, which appertain not only to the *Nymphalinae* (both *Morphina* and *Nymphalina*) but also to the *Satyrinae*. It is, however, scarcely a satisfactory feature in the study of Eastern Rhopalocera that since the time of Horsfield's epoch-making publication, scarcely anything has been published illustrative of the larvæ of Oriental species, till—after an expiration of fifty years—the drawings of the Bros. de Alwis have recently appeared in Moore's 'Lepidoptera of Ceylon.' This is the more regrettable when we remember the number of enthusiastic collectors of butterflies, especially in the East, whose captures, though of high scientific value,—as increasing our knowledge of genera and species, and therefore necessarily of the geographical distribution of the same,—could still add so much to our knowledge by careful breeding, and even more careful description of the results of the same. Conchologists are now agreeing that the description of the outer covering of the animal alone does not necessarily meet the requirements of biology, and the time is probably not far distant when the true describer of an insect will be expected to give its life-history. In Japan Mr. H. Pryor is adding greatly to our knowledge in this respect (see Trans. Ent. Soc. 1882, p. 485), and Mr. Hocking has lately contributed to our information of the earlier stage of Himalayan Rhopalocera (Proc. Zool. Soc. 1882, p. 234).

## SYNOPSIS OF GENERA.

1. Costal nervure of anterior wings strongly swollen at base.
  - a. Middle disco-cellular nervule of anterior wings but little longer than the upper disco-cellular.
  - b. Wings somewhat slender, the outer margin of the anterior wings more or less oblique. - - - EURYTELA.
  - aa. Middle disco-cellular nervule of anterior wings much longer than the upper disco-cellular.
  - bb. Wings broad, the outer margins of the anterior wings more or less convex. - - - - - ERGOLIS.
2. Costal nervure of anterior wings often robust, but not swollen.
  - A. Anterior wings with the apical angles more or less falcate and truncate.
    - c. Abdominal margins of posterior wings convex and overlapping near base, and then strongly divergent and concave to anal angle.
    - d. Third subcostal nervule of anterior wings emitted some distance before the apex of second subcostal nervule.
      - e. Outer margins of wings entire.
        - f. Posterior wings elongate and subtriangular. - DOLESCHALLIA.
      - cc. Outer margins of wings distinctly waved.
        - ff. Posterior wings subovate.
          - g. Lower disco-cellular nervule of anterior wings slender, indistinct, or subobsolete.
          - h. Antennæ with the apex gradually and moderately thickened. - - - - - PRECIS.
          - gg. Lower disco-cellular nervule of anterior wings almost completely obsolete.
            - hh. Antennæ with the apex abruptly and prominently thickened. - - - - - JUNONIA.
      - cc. Abdominal margins of posterior wings convex and overlapping near base, and then distinctly concave and moderately divergent to anal angle.
      - dd. Third subcostal nervule of anterior wings emitted almost beneath the apex of second subcostal nervule.
        - ee. Outer margins of posterior wings prominently produced in caudate elongation at apex of discoidal nervule. - - - - - RHINOPALPA.
    - B. Anterior wings with apical angles elongate, rounded, or subacute.
      - i. Body stout, the thorax robust.
        - j. Third subcostal nervule of anterior wings more or less convexly rounded towards apex.
        - k. Outer margins of posterior wings entire, not caudate.
        - l. Fourth subcostal nervule of anterior wings nearly straight.
          - m. Lower disco-cellular nervule of anterior wing obsolete, leaving cell entirely open. - - - EULACURA.
      - kk. Outer margins of posterior wings caudately and narrowly produced at first, and also generally at third median nervule.
        - ll. Fourth subcostal nervule of anterior wings concavely emarginate towards apex.



FIG. 26.—Arrangement of subcostal nervules in ant. wings of *Doleschallia pratipa*.



FIG. 27.—Arrangement of subcostal nervules in ant. wings of *Rhinopalpa fulva*.



FIG. 28.—Arrangement of subcostal nervules in ant. wings of *Clauxes schreiberi*.

- mm.* Lower disco-cellular nervule of anterior wings present, closing apex of cell. - - - - CHARAXES.
- kkk.* Outer margins of posterior wings produced in broad and spatulate prolongation between first and second median nervules. - - - - PROTHOE.
- ii.* Body generally and moderately stout, the thorax not prominently robust.
- jj.* Third subcostal nervule of anterior wings not suddenly and convexly rounded towards apex.
- n.* First and second subcostal nervules of anterior wings emitted before end of cell.
- o.* Margins of posterior wings entire, not caudate.
- p.* Palpi obtusely pointed.
- q.* Posterior wings almost as broad as long. - - SYMPLEDRÆ.
- qq.* Posterior wings distinctly longer than broad.
- r.* First subcostal nervule of posterior wings emitted close to base of subcostal nervure. - EUTHALIA.
- pp.* Palpi with a slender bristle-like terminal joint.
- rr.* First subcostal nervule of posterior wings emitted at some distance from base of subcostal nervure. - - - - TANÆCIA.
- nn.* First subcostal nervule only of anterior wings emitted before end of cell.
- oo.* Margins of posterior wings distinctly caudate in the male. - - - - EURIPUS.
- iii.* Body slender; wings delicate, generally pale and often subhyaline.
- nnn.* First and second subcostal nervules of anterior wings emitted before end of cell. - - - - CYRESTIS.
- nnnn.* First subcostal nervule only emitted before end of cell. CHERSONESIA.\*
- jjj.* Second and third subcostal nervules of the anterior wings more or less suddenly amplified and rounded shortly after their emergence.
- s.* Outer margin of anterior wings distinctly longer than interior margin.
- t.* Fourth subcostal nervule of anterior wing bent and angulated near middle.
- u.* First and second median nervules of anterior wings with their bases widely separated, the first not rounded and slightly curved inwardly. PARTHENOS.
- uu.* First and second median nervules of anterior wings with an apparently common origin, the first rounded outwardly at base. - - - - LEBADEA.
- ss.* Outer and inner margins of anterior wings subequal in length.
- tt.* Fourth subcostal nervule of anterior wings bent and angulated near base.
- v.* Discoidal nervules of anterior wings emitted at about one-third from base of wing. - - PANDITA.
- vv.* Discoidal nervules of anterior wings emitted considerably beyond basal third of wing.
- w.* Third median nervule and first subcostal nervule of posterior wings about subequal in length. - - - - LIMENITIS.



FIG. 29.—Arrangement of subcostal nervules in post. wings of *Euthalia anosta*.



FIG. 30.—Arrangement of subcostal nervules in post. wings of *Tanaëcia pulasara*.



FIG. 31.—Arrangement of median nervules in ant. wings of *Parthenos gambrisius*, var.



FIG. 32.—Section of ant. wing of *Limenitis procris*, showing fourth subcostal nervule angularly bent near base.

\* Gen. nov. type *Cyrestis rahria*, Moore.

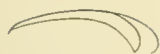


FIG. 33.—Costal area of post. wing of *Athyma leucothoe*, showing costal nervure extending to apical angle.

- uw.* Third median nervule of posterior wings distinctly shorter than first subcostal nervule.
- x.* Costal nervure of posterior wings extending to apical angle. - - - - - ATHYMA.
- xx.* Costal nervure of posterior wings not extending to apical angle. - - - - - NEPTIS.
- ttt.* Fourth subcostal nervule of anterior wings not angularly bent.
- www.* Third median nervule and first subcostal nervule of posterior wings almost subequal in length. - - - - - HYPOLIMNAS.
- n.* First subcostal nervule of anterior wings emitted just before or at end of cell, the second some distance beyond.
- ttt.* Fourth subcostal nervule of anterior wings not prominently bent or angulated.
- vvv.* Discoidal nervules of anterior wings emitted beyond basal third of wing.
- y.* Wings with the outer margins sinuate and dentate. - - - - - CETHOSIA.
- yy.* Wings with the outer margins slightly waved, that of posterior wings sometimes caudate. ATELLA.
- vvv.* Discoidal nervules of anterior wings emitted at about one-third from base of wings. - - - CUPHA.†
- nn.* First subcostal nervule of anterior wings emitted a little before and the second at about end of cell.
- tttt.* Fourth subcostal nervule of anterior wings prominently bent and angulated.
- z.* Middle disco-cellular nervule of anterior wings about half the length of lower disco-cellular.
- \**. Posterior wings ovate and elongate. - - - CIRROCHROA.
- zz.* Middle disco-cellular nervule of anterior wings less than half the length of lower disco-cellular.
- \*+.* Posterior wings more or less subquadrate and caudate. - - - - - TERINOS.
- nnn.* First subcostal nervule of anterior wings emitted a little before and the second immediately beyond end of cell. - - - - - CYNTHIA.



FIG. 34.—Arrangement of subcostal nervules in ant. wings of *Atella phalanta*.



FIG. 35.—Arrangement of subcostal nervules in ant. wings of *Cirrochroa orissa*.



FIG. 36.—Arrangement of subcostal nervules in ant. wings of *Cynthia deione*.

Genus DOLESCHALLIA.‡

*Doleschallia*, Felder, Neues Lep. p. 14 (1861); Moore, Lep. Ceyl. i. p. 38 (1881).

Anterior wings subtriangular, the costal margin arched from base and convex, the apical angle more or less truncated; the outer margin sinuated, concave beneath apex, and convex towards posterior angle; the inner margin more or less concave. First and second subcostal nervules emitted somewhat close together near end of cell; third emitted beyond cell, and extending to apex; fourth and fifth bifurcating at about one-third from apex. Upper disco-cellular nervule short and outwardly angled; lower disco-cellular

† This genus has been hitherto mostly known under the name of *Messaras*, Doubl., but has been recently shown by Mr. Scudder to be a synonym of *Cupha*, Billb. (Proc. Am. Acad. Arts & Sci. vol. x. p. 149. 1875).

‡ The name of this genus exists in commemoration of that of Carl Ludwig Doleschall, a Hungarian entomologist, who for a short time was numbered amongst the few workers in the Malayan Archipelago. Best known as a Dipterist, he died of consumption at Amboina at the age of thirty-two. His former friend and pupil, Rudolf Felder, whose name is attached to many of the Rhopalocera described in this work, and who founded the genus *Doleschallia*, also died at the early age of twenty-nine.

nervule aborted, leaving the cell widely open. Median nervules widely separated, the first prominently rounded at base; submedian nervule nearly straight. Posterior wings elongate and subtriangular, the costal and outer margins convex; anal angle produced in narrow caudate elongation, which is traversed by the submedian nervule; abdominal margins convex and contiguous near base, and from thence becoming concavely divergent to anal angles. Costal nervule arched and extending to apex; precostal nervule obliquely rounded and curved outwardly towards apex; discoidal nervules well separated at their origin; discoidal cell with the apex quite unclosed, first median nervule arched and rounded at a short distance from base. Body short, robust; palpi large and porrect, raised above the upper margin of the head, gradually narrowed to an obtuse point at apices, flattened beneath and covered with adpressed hairs, and clothed above (excluding apices) with long semi-erect and well-separated hairs.

About twelve or thirteen species are sometimes included in this genus; but of these, two are probably not strictly congeneric, as the apical angles of the anterior wings are acute. These two species also belong to the Ethiopian region, one being found in West Africa, and the other in Madagascar. The remaining and more typical species inhabit an area extending from India to Australia, and it is in the Papuan and Pacific regions that they mostly abound, where, according to present knowledge, the number of species is rather more than double what is found in the Indo-Malayan region. The genus is closely allied to *Kallima*, the species of which are commonly known as "leaf-butterflies," from the strikingly foliaceous appearance of the under side of the wings, and whose habitat is almost exclusively the Indo-Malayan region. *Doleschallia* thus appears as the extreme eastern representative of *Kallima*, a genus which most probably inhabits the Peninsula, it being already recorded from Tenasserim.

The larva and pupa of the Ceylon species is figured in Moore's 'Lep. Ceylon,' from drawings made by the Bros. de Alwis, and as described is "long, somewhat slender, purple-black, with a dorsal and lateral series of short delicate branched blue spines" and "a central row of white spots." It is stated in Ceylon to feed on "Acanthads."\* The transformations of *D. bisaltide* in Java have also been described by Piepers.†

One species only is at present known in the Malay Peninsula.

1. *Doleschallia pratipa*. (Tab. XI., fig. 8 ♂; Tab. IX., fig. 6 ♀.)

*Doleschallia Pratipa*, Felder, Wien. Ent. Mon. iv. p. 399, n. 20 (1860); Reise Nov. Lep. iii. p. 406, n. 610 (1866); Moore, Proc. Zool. Soc. 1877, p. 584; *ibid.* 1878, p. 828; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539, n. 1 (1877).

Male. Apical angle of the anterior wings prominently falcate. Anterior wings reddish ochraceous; apical angle, outer margin (narrowing to posterior angle), and an irregularly shaped and sized oblique fascia commencing near costal nervule, crossing end of cell and amalgamating with outer margin between the lower subcostal and first median nervules, very dark fuscous. Posterior wings reddish ochraceous, with two distinct submarginal fuscous rounded spots, situate one above the discoidal nervule and one between the second and third median nervules, and a very pale fuscous and moderately broad marginal fascia, with the inner border strongly waved and the outer border ochraceous, preceded by a black line. Wings beneath dull ochraceous, strongly suffused with olivaceous; anterior wings with two waved and sinuated transverse bright white fasciæ crossing cell, and a smaller and more obscure irregular spot beneath cell at base of third median nervule; posterior wings with three bright

\* Lep. Ceyl. i. p. 39.

† Tijdschr. Ent. xix. p. 151-2 (1876).

white spots near base, one near base of costal nervure, one near base of third median nervule, and the third very obscure, in and near base of cell. Anterior wings with the costal base, cellular area preceding the outer white fascia, an irregular fascia near end of cell, and a small costal subapical patch, dark olivaceous, the last preceded and followed by dull whitish; both wings crossed by a discal oblique dark olivaceous line, commencing on costa of anterior wings between end of cell and apex, where it is waved and directed outwardly and then reflexed and oblique, terminating near anal angle of posterior wings; between this line and outer margin there are on anterior wings five or six obscure white-centred spots divided by the nervules, and two distinct ocellated spots with white centres between the median nervules and on posterior wings three distinct ocellated spots situate one on each side of the lower subcostal nervule, and the third between the second and third median nervules (a fourth and obscure spot is sometimes visible between the third median nervule and submedian nervure); outer margin of posterior wings distinctly paler from about the lower subcostal nervule. Body and legs more or less concolorous with wings.

Female. Apical angle of the anterior wings not prominently falcate. Resembling male, but differing on anterior wings by having a large subapical yellowish patch, and by the fuscous oblique fascia being only denoted by an irregular spot at end of cell. Posterior wings with the marginal fascia only denoted by the marginal borders as in male. Wings beneath as in male, but paler, and with the white spots much more obscure.

Exp. wings, ♂ 60 to 80 millim.; ♀ (two examples), 68 to 70 millim.

HAB.\*—Tenasserim (Moore).—Malay Peninsula; Province Wellesley (colls. Dist. and Säuer); Malacca (Pinwill, Brit. Mus.)—Java (coll. Dist.)

This species varies much in the colour of the wings beneath, and is a very close ally of the Javan species, *D. bisaltide*, Cram. From this it differs principally in the female sex, which in *D. bisaltide* has the pale subapical patch and also the complete oblique subapical fuscous fascia. *D. pratipa* is clearly a local race of Cramer's species, and is treated here as a distinct species, in consonance with the previous method, and on the lines already laid down in this work.†

### Genus PRECIS.

*Precis*, Hübner, Verz. bek. Schmett. p. 33 (1816); Feld. Neues Lep. p. 13 (1861); Moore, Lep. Ceyl. i. p. 39 (1881).  
*Junonia*, sect. 2, Doubl. Gen. Diurn. Lep. p. 209 (1849).

Anterior wings subtriangular, the costal margin very strongly arched and convex; apical angle obliquely truncate and prominent, and together with remainder of outer margin distinctly waved; beneath the apical angle the outer margin is strongly sinuated and concave, after which it is convex to posterior angle; inner margin more or less concave. Costal nervure short; first and second subcostal nervules emitted close together near end of cell; third emitted about half-way between end of cell and apex of wing; fourth and fifth bifurcating at about one-fourth from apex. Upper disco-cellular nervules angled at apex of cell and concave to lower discoidal nervule; lower disco-cellular nervule slender and indistinct, or somewhat obsolete. Discoidal nervules well separated at their base; first median nervule rounded at base, where it

\* Mr. Moore (Proc. Zool. Soc., 1877, p. 584) has recorded this species as from the Andaman Islands, but this habitat has not been corroborated by Messrs. Wood-Mason and De Nicville, in their Catalogue of the Rhopalocera of those islands. Mr. Kirby, in his Catalogue (p. 193), has also given "Moluccæ" as a habitat, which is clearly a misprint.

† *D. bisaltide* is a somewhat rare insect; male and female specimens are contained in the Horsfield Collection which agree with Cramer's figure. Several other specimens were confused, however, under the same name, which on examination with Mr. Butler, proved to be both male and female *D. polibete*, Cram., a species which is quite distinct and not synonymous with *D. bisaltide*, as stated in Mr. Kirby's Catalogue (p. 193). *D. polibete* has both sexes very similar, and not distinct as in *D. bisaltide* and *D. pratipa*; it is also a wide-ranging species, as I possess specimens both from Java and the Andaman Islands. In all these species it appears that the brightest white spots on the under surfaces of the wings are developed in the male only.

has an apparently common origin with the second; second and third nervules widely separated. Posterior wings subovate, the costal margin obliquely convex; outer margin very convex, waved, and produced into a short caudate appendage at anal angle. Abdominal margins convex and overlapping at base, and then distinctly concave and slightly divergent to anal angles. Costal nervure arched and extending to apex; discoidal nervule emitted a little beyond the bifurcation of the subcostal nervules; discoidal cell with the apex entirely open; median nervules arranged much as in anterior wings. Body short; palpi long, porrect, and pointed; antennæ slender, gradually thickened towards apex.

This genus is of very considerable extent, and it is in Africa—tropical and subtropical—that its greatest number of species are found; in fact, if we include Madagascar, at least three-fourths of the present known species inhabit the Ethiopian region.\* *Precis* is also found in Continental India, Ceylon, and onwards, and sparingly—as regards its number of species—through the Malay Peninsula and Malayan Archipelago, and is represented in Australia. At this time about forty species have been described.

1. *Precis iphita*. (Tab. XI., fig. 9 ♂; & var. Tab. IX., fig. 5 ♀.)

*Papilio Iphita*, Cramer, Pap. Ex. iii. t. 209, C, D (1782); Fabr. Sp. Ins. p. 86, n. 379 (1781); Mant. Ins. p. 46, n. 457 (1787); Ent. Syst. iii. p. 109, n. 337 (1793).

*Vanessa Iphita*, Godt. Enc. Méth. ix. p. 314, n. 40 (1819).

*Precis Iphita*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 143, n. 290 (1857); Snellen, Tijd. Ent. vol. xix. p. 150, n. 31 (1876); Moore, Proc. Zool. Soc. 1878, p. 828; *ibid.* 1882, p. 239; Lep. Ceyl. i. p. 39, pl. 21, f. 1, a, b (1881).

*Junonia Iphita*, Butl. Cat. Fabr. Lep. p. 76, n. 17 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 1 (1877); Godm. & Salv. Proc. Zool. Soc. 1879, p. 157, n. 17; *ibid.* 1878, p. 646.

*Precis Intermedia*, Feld. Reise Nov. Lep. iii. p. 402, n. 600 (1866).

*Precis Ida*, var. *intermedia*, Snell. Tijdschr. Ent. vol. xxi. p. 14, n. 62 (1878).

Male and female. Wings above fuliginous-brown, variable in intensity of hue. Anterior wings with two transverse fasciæ crossing cell, the margins of which are very irregular and dark fuscous, the first situate about centre and the second near apex; the apical half of wing is somewhat paler, and inwardly bounded by a dark fascia commencing near costa and outwardly and obliquely directed to first median nervule, from thence reflexed inwardly and terminating near centre of inner margin; between this and outer margin is a somewhat similar fascia, followed by two very dark submarginal lines, the outer one more prominently waved; marginal fringe and a small subapical spot whitish. Posterior wings with the apical half paler and with the fasciæ on the anterior wings continued, the first terminating near abdominal margin about one-third from anal angle, the second broader and more outwardly curved than on anterior wings, and possessing on its outer edge four or five obscure ocellated spots placed between the nervules; submarginal lines as on anterior wings, but the inner one more waved. Wings beneath paler; both wings crossed by two somewhat broad, dark, basal fasciæ, the first crossing centre of cell of anterior wings, curved inwardly on cell of posterior wings and indistinctly terminating near base of abdominal margin; the second crossing anterior wings at apex of cell, and terminating on posterior wings a little beyond end of cell; a similar fascia commencing near costa of anterior wings, and more or less amalgamating at median nervules, with an oblique fascia crossing both wings, inwardly margined with a dark line commencing near apical angle of anterior wings where it is broadest, and terminating near anal angle of posterior

\* The Oriental affinities in the African fauna, or the zoological relationship between the Oriental and Ethiopian regions, have received notice by many naturalists. Thus Dr. Stoliezka has pointed this out in the Malayan Ornithology, and Mr. Wallace has described the same thing in the Mammalia and birds of W. Africa,—these possessing “a special Oriental or even Malayan element,”—and has also drawn attention to the Oriental element in the Ethiopian reptiles and amphibia. Mr. Blandford has treated of the “African element in the fauna of India,” particularly as regards the Mammalia, and the late Mr. Blyth has shown the ancient date of the relationship from the evidence afforded by the Siwalik deposits. Mr. Murray inclined to the opinion that the Indo-Malayan region should be included with that of Africa, south of the Sahara. The writer has also shown the “Oriental affinities in the Ethiopian Insect-Fauna” (*Nature*, vol. xvii. p. 282).



wings where it is narrowest; on the outer margin of this fascia in both wings are a series of more or less obscure ocellated spots placed between the nervules; two submarginal lines as on upper surface, but inner one much waved and sinuated. On some specimens there are two distinct whitish spots on the underside of posterior wings, separated by the first subcostal nervule, the upper of which is largest. (These are absent in the specimens here figured, though found in some Malay varieties.) Body and legs more or less concolorous with wings.

Exp. wings, ♂ & ♀, 60 to 70 millim.

HAB.—Continental India; Nepaul; Khasia Hills; Silhet; Cashmere; Neilgherries; Bombay (colls. Moore and Brit. Mus.)—Ceylon (colls. Moore and Brit. Mus.)—Upper Tenasserim; Moolai (Moore).—Malay Peninsula; Penang; Province Wellesley (colls. Dist. & Saüer); Malacca (Pinwill, Brit. Mus.)—Java (coll. Moore); Batavia (Snellen); Bantam (coll. Dist.)—Borneo.\*—Celebes (Snellen).—New Guinea (Godm. and Salv.)—New Britain (Godm. & Salv.)

This is a variable species, both in size and hue, the specimen (Tab. XI., f. 9) being a melanic form, whilst that represented by fig. 5 on Tab. IX. is the pale variety described by Felder as a distinct species under the name of *P. intermedia*. The larva and pupa are figured in Moore's Lep. Ceyl.† from drawings made by the Bros. de Alwis, and they are thus described in that work: ‡—"Larva cylindrical, dark brown, with dorsal and lateral rows of short delicate branched spines. Pupa short, with tubercular points on dorsal segments; thorax broad."

Some observations on the habits of this insect have been recorded. In the N.W. Himalaya Mr. Hocking states that it "always pitches on the ground."§ As witnessed in Celebes, that inimitable lepidopteral observer Piepers has given some interesting facts. It appears to be pugnacious. Piepers thus describes his observation:—"Around and over the blossoms of a flowering shrub flew several butterflies (*Precis iphita* and some *Pieride*), when a butterfly of gigantic size, in comparison with them (*Papilio Remus*, Cram.), came flying, apparently with the object of sharing their repast. Whether the others were desirous of the company of a guest among them whose appetite would be enormous, or not, it is certain that I saw them attack the *P. Remus*, drive it away, and pursue it for a short distance, till it was evident that it had really taken to flight, when they returned to their flowers."||

The same author adds an observation bearing on the constancy of habits or memory in this species.¶ He one evening observed a specimen of this butterfly sitting quietly on the ceiling of the open verandah of the Harmonic Society, at Manghasar, which remained the whole evening, despite the strong illumination of the place. For six consecutive evenings he found this insect return faithfully to the same sleeping-place, though absent during the day.\*\*

\* Cat. Diurn. Lep., formed by Hewitson, p. 72.

† Pl. 21. f. 1 b.

‡ Vol. i. p. 40.

§ Proc. Zool. Soc., 1882, p. 239.

|| Tijds. Ent. xix., pp. xviii to xxiv, and Eng. transl. by Kirby, 'Entomologist,' x. p. 269.—In N. America Mr. W. H. Edwards relates seeing an introduced *Papilio machaon* pursued by *P. ajax*, "as if it was regarded as an intruder" (Canad. Entomol. vol. xiv. p. 22 (1882).

¶ Ibid. p. 270.

\*\* It is probable that many butterflies are constant and regular to fixed spots for the night's repose. Long since Mr. P. H. Gosse (Ann. & Mag. Nat. Hist., ser. 2, vol. ii., pp. 176—78 (1848)) gave an exceedingly graphic account of the habits of *Heliconius charithonia* as observed in Jamaica. Butterflies of this species assembled in a little swarm just before sunset, and settled closely packed together on some leafless stems of a creeping plant, and Mr. Gosse was assured by an "observant young friend" that they assembled in this manner every evening.

Mr. A. W. Bennett (Proc. Brit. Ass., York, 1881), in a paper "On the Constancy of Insects in visiting Flowers," stated that he had observed three flights of the "painted lady" butterfly (*Pyrameis cardui*), and that it settled six, three, and ten times respectively, always confining itself to the same species of flower. The result of his observations on the common English butterflies was that *P. cardui* and the "small tortoise-shell" (*Vanessa urticae*) were very consistent in their floral tastes. Mr. Powell, however ('Nature,' vol. xxiv., p. 509), observed a specimen of the last-named butterfly which exhibited no constancy in this respect.

2. *Precis ida*. (Tab. XI., fig. 10 ♀.)

*Papilio Ida*, Cramer, Pap. Ex. i. t. 42, C, D (1776); ib. iv. t. 374, C, D (1782).

*Apatura Tragia*, Hübn. Verz. bek. Schmett. p. 35, n. 295 (1816).

*Vanessa Idamene*, Godt. Ene. Méth. ix. p. 315, n. 41 (1819).

*Precis ida*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 142, n. 289 (1857).

*Junonia ida*, Druce, Proc. Zool. Soc. 1873, p. 342, n. 3; Godm. & Salv. Proc. Zool. Soc. 1878, p. 639, n. 17 (1878).

Male and female. Closely allied to the preceding species, but paler and more rufous both above and beneath; wings above marked as in *P. iphita*, but anterior wings having a more or less well developed and distinct series of ocellated spots, placed between the nervules and occupying the centre of the pale apical portion. Posterior wings with a very distinct and well developed series of ocellated spots placed between the nervules, and continuous with those of anterior wings. Wings beneath as in *P. iphita*, but paler and more rufous.

Exp. wings, ♂ and ♀, 60 to 70 millim.

HAB.—Malay Peninsula; Penang (Brit. Mus.); Province Wellesley (coll. Dist.)—Billiton (Godm. and Salv.)—Java (coll. Moore).—Borneo (colls. Moore, Godm. & Salv., and Dist.)—Celebes (coll. Dist.)

Herr Snellen\* is of opinion that this insect and *P. iphita* may be but seasonal forms of the same species. As, however, *P. ida* does not appear to be recorded from Continental India, where *P. iphita* is a not uncommon species, there seems reason to doubt what would otherwise seem to be a probable supposition. Although paler in coloration than *P. iphita*, a Celebesian specimen in my own collection is melanic and approaches somewhat to that species in hue; the series of ocellated spots on the upper surface of the anterior wings, however, prevents confusion.

## Genus JUNONIA.

*Junonia*, Hübner, Verz. bek. Schmett. pp. 34, 35 (1816); Feld. Neues. Lep. p. 13 (1861); Moore, Lep. Ceyl. i. p. 40 (1881); Godm. & Salv. Biol. Centr. Am. Rhop. p. 219 (1882).

*Junonia*, seet. 1, Doubl. Gen. Diurn. Lep. pp. 206, 208 (1849).

*Acyonets*, Hübn. Verz. bek. Schmett. p. 35 (1816).

This genus is very closely allied to the preceding, the general shape and venation of the wings being similar and almost identical. It principally differs in having the lower disco-cellular nervule of the anterior wings completely obsolete, thus leaving the apex of the cell entirely open. The club of the antennæ is also more abruptly and prominently incrassated.

This genus is of considerable extent and of wide distribution. It is found in the warmer parts of America, the tropical and subtropical portions of Africa (including Madagascar), Asia, eastwards from Continental India, throughout the Malayan Archipelago, and onwards amongst the islands of the Pacific; it is also represented in Australia. Probably a little over twenty species are known, and though more have been described they are now generally considered as of a varietal character only.

*Junonia*, unlike *Iphita*, is most strongly represented in the Oriental region, only about a third of its species being Ethiopian, whilst its representatives in America are reduced to three by Mr. Kirby, † and again considered as but two by Messrs. Godwin and Salvin. ‡

\* Tijds. Ent. xix. p. 150 (1876).

† Cat. Diurn. Lep. pp. 187-8 (1871).

‡ Biol. Centr. Am. Rhop. p. 219 (1882).

1. *Junonia atlites*. (Tab. XI., fig. 11 ♂, 12 ♀.)

*Papilio Atlites*, Linnæus, Cent. Ins. p. 24, n. 72 (Amoen. vi. p. 407) (1763).

*Papilio Laodamia*, Clerck, Icones Ins. iii. (ined.), t. 7, f. 5 (1764).

*Papilio Laomedea*, Linn. Syst. Nat. ed. xii. p. 772, n. 145 (1767); Drury, Hi. Ex. Ins. i. p. 12, t. 5, f. 3 (1770); Müll. Naturf. v. i. p. 603, n. 145 (1774); Cram. Pap. Exot. i. t. 8 F, G (1775); Fabr. Syst. Ent. p. 494, n. 219 (1775); Spec. Ins. ii. p. 75, n. 333 (1781); Ent. Syst. iii. 1, p. 98, n. 302 (1793); Sulz. Gesch. Ins. p. 144, t. 16, f. 10 (1776); Gmel. Syst. Nat. i. 5, p. 2298, n. 145 (1790); Herbst, Nat. Schmett. vii. p. 144, n. 49, t. 174, f. 1, 2 (1794).

*Temenis Laomedea*, Hübn. Verz. bek. Schmett. p. 34, n. 283 (1816).

*Vanessa Laomedea*, Godt. Enc. Méth. ix. p. 322, n. 59 (1819); Lucas, Lep. Exot. p. 112, t. 58, f. 3 (1845).

*Junonia laomedea*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 140, n. 283 (1857); Butl. Cat. Fabr. Lep. p. 77, n. 19 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 2 (1877); Druce, Proc. Zool. Soc. 1873, p. 342, n. 1; ibid. 1874, p. 105, n. 2; Snellen, Tijd. Ent. xix. p. 151, n. 33 (1876); ibid. xx. p. 66 (1877); ibid. xxi. p. 14 (1878); Moore, Proc. Zool. Soc. 1878, p. 828; Godm. & Salv. Proc. Zool. Soc. 1878, p. 639, n. 16; Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 233, n. 20 (1881); ibid. vol. li. p. 16, n. 22 (1882).

*Precis laomedea*, Moore, Lep. Ceyl. i. p. 40, t. 21, f. 2 (1881).

*Junonia atlites*, Aurivill. Kongl. sv. vet. Akad. Handl., Band. 19, p. 80 (1882).

Male. Wings above lilacinous. Anterior wings with two waved black lines crossing centre of cell, and two similar ones at end of cell; a very waved and sinuated fuscous line crossing wings a little beyond cell, and between this and outer margin are two waved fuscous lines (the inner one somewhat faint), between which the colour is distinctly paler, and is marked with a series of six ocellated spots placed between the nervules, of which the first is situate above the upper discoidal nervule, and the first, second and fifth are largest and most brightly coloured; the first is also preceded by an irregular whitish spot placed at the bifurcation of the fourth and fifth subcostal nervules; fuscous marginal and submarginal lines. Posterior wings with two waved fuscous lines crossing end of cell, and remaining markings similar and continuous to those on anterior wings, but with five distinct ocellated spots only (a sixth sometimes obsoletely present between third median nervule and submedian nervure), and of which the first, second, and fifth are largest and most brightly coloured. Wings beneath very pale; cell crossed by the fuscous lines as above, but fainter, and the two central ones continued on lower wings and terminating near median nervure; a distinct fuscous line crossing both wings, commencing near costa a little beyond end of cell, where it is angularly waved to first median nervule and then obliquely and more straightly continued across both wings to near anal angle of posterior wings; ocellated spots of upper surface more or less distinctly visible, their outer marginal line present, but the marginal and submarginal lines (in the specimen figured and described) absent; posterior wings with the two fuscous lines crossing end of cell as above, and with a small fuscous spot near anal angle. Body and legs more or less concolorous with wings.

Female. Larger in size and generally darker in colour than the male, the ocellated spots above larger and more distinct, with the area on which they are placed much paler, the fuscous lines deeper in hue; beneath the wings are also slightly darker than in the male, and the ocellated spots and markings much more distinct, and with the marginal and submarginal lines often distinguishable.

Exp. wings, ♂ (one spec), 48 millim.; ♀ 59 to 65 millim.

HAB.—Continental India; Caehar (Brit. Mus.); Calcutta; Malabar (coll. Moore).—Ceylon (coll. Moore).—Nicobar Islands; Nankowri; Kamorta; Katschall (Wood-Mas. & de Nic.)—Burma; Moulmein.—Tenasserim; Nathoung; Paboga (Moore).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.)—Sumatra (Snellen).—Billiton (Godm. & Salv.)—Java (coll. Moore and Brit. Mus.); Batavia

(Snellen).—Borneo (Brit. Mus.)—Siam; Chentaboon and Nahconchaisee (Layard—coll. Godm. & Salv.)—China (Brit. Mus.)—Hainan (coll. Moore).

The principal variation in this widely-spread insect is in depth of intensity in hue. The species has hitherto been almost universally known as *J. luomedia*, Linn., but as Dr. Aurivillius has recently shown that Linnæus had previously described it under the name of *P. atlites*, the law of priority must therefore be followed. The larva and pupa of this species are described and figured by Horsfield,\* and the larva in Java is stated to feed on a species of *Achyranthes*, † bearing the native name of *Krema*.

## 2. *Junonia asterie*. (Tab. XI., figs. 1 ♀ & 2 ♀.)

*Papilio Asterie*, Linnæus, Syst. Nat. ed. x. p. 472, n. 90 (1758); *ibid.* ed. xii. p. 769, n. 133 (1767); Houtt. Naturl. Hist. i. 11, p. 284, n. 90 (1767); Müll. Naturs. v. 1, p. 600, n. 133 (1774); Fabr. Syst. Ent. p. 490, n. 205 (1775); Spec. Ins. ii. p. 69, n. 312 (1781); Mant. Ins. ii. p. 34, n. 363 (1787); Ent. Syst. Nat. iii. 1, p. 89, n. 279 (1793); Gmel. Syst. Nat. i. 5, p. 2291, n. 133 (1790); Herbst, Naturs. Schmett. vii. p. 131, n. 42, t. 172, f. 3, 4 (1794).

*Papilio Almana*, Clerck, Icones Ins. iii. (ined.), t. 5, f. 3 (1764); Thunb. Mus. Nat. Ups. xxiii. p. 8 (1804).

*Aleyonéis Asterie*, Hübn. Verz. bek. Schmett. p. 35, n. 292 (1816).

*Vanessa Asterie*, Godt. Enc. Méth. ix. p. 321, n. 58 (1819).

*Junonia Asterie*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 142, n. 287 (1857); Butl. Cat. Fabr. Lep. p. 72, n. 1 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 5 (1877); Druce, Proc. Zool. Soc. 1874, p. 105, n. 3; Snellen, Tijd. Ent. xix. p. 151, n. 35 (1876); *ibid.* xx. p. 66 (1877); *ibid.* xxi. p. 14, n. 66 (1878); Wood-Mas. & de Nic. J. A. S. B. vol. xlix. p. 227, n. 18 (1880); Moore, Lep. Ceyl. i. p. 43, t. 22, f. 2 (1881); Aurivill. Kongl. sv. vet. Akad. Handl. Band. 19, p. 79 (1882).

*Junonia asterie*, var. *nikobariensis*, Feld. Verh. Zool. Bot. Ges. xii. p. 482, n. 110 (1862); Wood-Mas. & de Nic. J. A. S. B. vol. l. p. 233 (1881).

*Junonia asterie*, var. *Javana*, Feld. Verh. Zool. Bot. Ges. xii. p. 487, n. 136 (1862).

Male and Female. Wings above warm ochraceous, with the basal areas of both wings slightly infuscated, and with the following markings:—anterior wings with the costal area pale fuscous and with an irregular fascia denoted by black margins crossing centre of cell, and a similar one with its internal area infuscated at end of cell; this is followed by a somewhat similar but darker fascia, which terminates at base of first median nervule, between which and apex is a subtriangular black patch more or less enclosing two ocellated spots divided by the upper discoidal nervule; a large ocellated spot placed on the centre of the second and third median nervules, with a white centre and black outer margin and a marginal and two submarginal black lines, the inner one of which is generally the palest, and the spaces between which are usually more or less infuscated. Posterior wings with a very large ocellated spot, purplish with two whitish inner spots, an outer black patch and yellow and black margins, the upper surface of which rests on the first subcostal nervule, and its posterior margin is situate between the discoidal and first median nervules, and a smaller one between the second and third median nervules; † marginal and submarginal lines as on anterior wings, but the inner one darkest. Wings beneath pale obscure ochraceous; the three basal costal fasciæ as on upper surface of anterior wings, but their internal areas not infuscated, and the outer margin

\* Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 140, t. v. f. 4, 4a.

† In Continental India a species of *Achyranthes* (*A. aspersa*—*apamarga*) is described as having medicinal properties, “the dried plant applied locally for infantile colic, also prescribed internally as a laxative and promoting secretion; the ashes, containing much potash, suitable to prepare alkaline medicines and caustic pastes, as detailed by Datt. (F. R. Hogg, M.D., ‘Indian Notes,’ p. 209, 1880).

‡ In some specimens this is practically obsolete.

of the third continued in an oblique line across both wings, terminating near anal angle of posterior wings, this line being inwardly and broadly margined with white; a slender, fuscous, irregularly rounded line at base of posterior wings, crossing cell; ocellated spots as above, but paler, the large discal spot on posterior wings being compressed, irregularly subovate and bipupilate,\* the lower spot usually larger than above; marginal and submarginal lines as above, the inner terminating in a small black spot at anal angle. Body and legs more or less concolorous with wings.

Exp. wings, ♂ and ♀, 48 to 58 millim.

HAB.—Continental India; Nepal, Calcutta, Bombay, Neilgherries (coll. Moore).—Ceylon (coll. Moore and Brit. Mus.)—Andaman Islands.—Nicobar Islands; Kar Nicobar (Wood-Mas. & de Nie.)—Burma (coll. Moore).—Malay Peninsula; Province Wellesley; Penang (colls. Dist. and Sauer); Malacca (Brit. Mus.)—Sumatra (Snellen).—Java (coll. Moore); Bantam (coll. Dist.); Batavia (Snellen).—Celebes (Snellen).—Philippine Islands (Brit. Mus.)—Siam; Naliconchaisee (coll. Godm. & Salv.)—Formosa (coll. Moore).—Japan (Brit. Mus.)—N. China (Brit. Mus.); Shanghai (Pryer†).

Although the female forms of this species are usually the largest, the rule does not universally apply, as the female specimen figured (Tab. XI., f. 1) bears witness.

The larva and pupa of this insect, as observed in Java, are described and figured by Horsfield; ‡ the larva is stated to feed “on a species of *Justicia* bearing the native name of *Keji-Wangu*,—March.”

In Ceylon this butterfly is stated to be “found all the year round,” and to be “very abundant about September to November” (Mackwood). §

### 3. *Junonia wallacei*, || n. sp. or var. (Tab. XI., figs. 3 ♂ and 4 ♀.)

*Papilio Orithya*, Linn., var. ?

Male. Anterior wings with the basal portion shining fuscous: costal area—excluding base and apex—very pale ochraceous; cell crossed by two reddish fasciæ, one near centre, the other near termination; a little beyond cell, commencing near subcostal nerve, is an oblique and inwardly much excavated pale ochraceous fascia which reaches outer margin near apices of the median nervules; beyond this is a smaller and shorter fascia terminating at upper discoidal nervule, and a fainter and less continuous submarginal fascia of the same colour; two ocellated spots, the first broadly surrounded with reddish between the discoidal nervules, the second and larger situate between the second and third median nervules; beneath this spot and near outer angle is a small pale bluish patch. Posterior wings pale bluish, abdominal margin pale fuscous, base and an irregular patch occupying lower half of cell, very dark fuscous or black; two ocellated spots, one black, with an obscure paler centre between the lower subcostal and discoidal nervules, the second and largest red, with a large pale bluish centre and black margins situate between the second and third median nervules; a marginal and two submarginal waved black lines, between which the colour is more or less distinctly pale ochraceous. Wings beneath pale but warm ochraceous; anterior wings with the base of cell, and two broad irregular fasciæ crossing cell, reddish ochraceous, the one at end of cell continued and terminating a little beneath third median nervule—this is followed by a narrow waved black fascia; remaining markings as above, but the ocellated spots much

\* In a Javan variety of my own collection this spot is round, but much smaller than above, and with a single whitish inner spot.

† Elwes (Proc. Zool. Soc. 1881, p. 896).

‡ Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 142, t. v. f. 6. 6a.

§ Moore's Lep. Ceyl. i. p. 43.

|| The name of A. R. Wallace is here once more affixed to an insect of that Malayan region with which he will always be remembered, and for a knowledge of which we are so much indebted to him. The range of *J. wallacei* is probably circumscribed by “Wallace's line,” and does not extend farther eastward.

darker. Posterior wings darker ochraceous, crossed by several waved and scalloped darker lines, with a wide, distinct, slightly darker submarginal fascia on which are placed the two ocellated spots as above, and a third and much more indistinct spot situate between the subcostal nervules; marginal and submarginal lines as above, but fainter and much paler. Body and legs more or less concolorous with wings.

Female. Wings above marked and spotted generally as in male, but brownish ochraceous, the blue colour being absent, the ocellated spots larger. Wings beneath almost precisely as in male, but the ocellated spot with larger pale margins, and posterior wings possessing some irregular reddish ochraceous fascia crossing cell.

Exp. wings, ♂ 40 to 50 millim.; ♀ 50 to 52 millim.

HAB.—Malay Peninsula; Province Wellesley (colls. Dist. and Säuer); Malacca (Brit. Mus.)—Java (coll. Dist.)

This form is evidently a local race of *J. orithya*,\* Linn., a well-known species in Continental India and elsewhere. It differs from typical forms of that species by the tawny colour of the female, and the absence of the blue and black markings to wings of the same. The male almost exactly resembles Hübner's figure of *J. ocyale*.† It is another of the many distinct "local races" found in the Malay Peninsula and neighbouring islands.

#### 4. *Junonia lemonias*. (Tab. XI., fig. 5 ♂.)

*Papilio Lemonias*, Linnaeus, Syst. Nat. ed. x. p. 473, n. 93 (1758); *ibid.* ed. xii. p. 770, n. 136 (1767); Clerck, Icones Ins. iii. (ined.), t. 7, f. 2 (1764); Houtt. Naturl. Hist. i. 11, p. 286, n. 93 (1767); Müll. Naturs. v. i. p. 601, n. 136 (1774); Fabr. Syst. Ent. p. 490, n. 207 (1775); Spec. Ins. ii. p. 70, n. 314 (1781); Mant. Ins. ii. p. 34, n. 365 (1787); Ent. Syst. iii. 1, p. 90, n. 282 (1793), (*part*); Sulz. Gesch. Ins. p. 144, t. 16, f. 7, et 11 (1776); Gmel. Syst. Nat. i. 5, p. 2292, n. 136 (1790); Herbst, Naturs. Schmett. vii. p. 158, n. 59, t. 177, f. 3, 4 (1794); Thunb. Mus. Nat. Ups. xxiii. p. 9.

*Papilio Aonis*, Cram. Pap. Exot. i. p. 55, t. 35, D F (1775).

*Hamadryas Lemonias*, Hübn. Samml. Exot. Schmett. i. t. 50 (1806-16).

*Junonia Aonis*, Hübn. Verz. bek. Schmett. p. 34, n. 284 (1816).

*Fanessa Lemonias*, Godt. Enc. Méth. ix. p. 311, n. 31 (1819).

*Junonia Lemonias*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 139, n. 281 (1857); Butl. Cat. Fabr. Lep. p. 74, n. 9 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 3 (1877); Druce, Proc. Zool. Soc. 1874, p. 105, n. 1; Moore, Proc. Zool. Soc. 1878, p. 828; Lep. Ceyl. i. p. 41, t. 21, f. 3, 3a (1881); Aurivill. Kongl. sv. vet. Akad. Handl., Band. 19, p. 82 (1882).

Male and Female. Wings above pale brownish ochraceous. Anterior wings with the cell crossed by the following markings:—a slender waved black line near base, two waved black lines enclosing a pale ochraceous fascia a little beyond centre, and a similarly coloured and enclosed fascia at about end of cell; beyond this the ground colour is somewhat darker and marked with the following pale ochraceous spots:—a discal series of six crossing wing and divided by the nervules, the upper spot beneath subcostal nervure and with the second and third forming a slightly oblique series; fourth and fifth directed inwardly, and sixth again deflexed outwardly beneath the third median nervule; this series is followed by another containing seven spots of the same colour, of which the upper three are divided by the fourth and fifth subcostal nervules; the fourth and fifth are separated by the first median nervule, and the sixth and

\* Under this name, as Dr. Aurivillius has recently shown (Kongl. sv. vet. Akad. Handl., Band. 19, pp. 82-3 (1882), have been included three distinct forms or species, *Junonia ocyale*, Hübn., *J. orithya*, Linn., and *J. orthosia*, Godt., neither of which are found in this fauna.

† Samml. Exot. Schmett. ii. t. 33, f. 3, 4.

seventh—which are small and somewhat indistinct—are placed on each side of the third median nervule; an indistinct submarginal series of spots placed between the nervules, and two ocellated spots, the first and smallest situate between the discoidal nervules, and the second and largest situate on the second and third median nervules. Posterior wings with a large elongated and duplex ocellated spot, the smaller portion of which is situate between the subcostal nervules, the larger portion extending over the discoidal nervule, and a very small and indistinct ocellated spot between the second and third median nervules, a broad fuscous submarginal line and two marginal lines of the same colour. Wings beneath pale and dull ochraceous. Anterior wings with the cell crossed by fasciæ as above; other markings generally as above; the upper ocellated spot indistinct. Posterior wings with several irregular, darker, basal fasciæ, and with a broad submarginal fascia enclosing five dark spots placed between the nervules, of which the second, situate above the discoidal nervule, and the fifth, placed between the second and third median nervules, are largest; marginal and submarginal lines as above. Body and legs more or less concolorous with wings.

Exp. wings, ♂ and ♀, 52 millim.\*

HAB.—Continental India; Scinde, Bombay, Calcutta, Neilgherries (coll. Moore).—Ceylon (coll. Moore).—Burma; Moulmein (Brit. Mus.)—Tenasserim; Meetan, Tao, Naththoung to Paboga (Limborg—Moore).—Malay Peninsula; Province Wellesley (colls. Dist. and Säuer).—Malacca (Pinwill—Brit. Mus.—Siam; Chentaboon and Nahconchaisee (Layard—Druce).—Hainan (coll. Moore).—Formosa (coll. Moore).—China; Hong Kong (Brit. Mus.) †

In North-Western India Capt. Lang reported having reared the larva of this species on *Barleria prionites*. ‡ The larva, as found in Ceylon, has been described by Mr. Moore, “cylindrical, smoky black, with a pale dorsal band and paler lateral lower shade; each segment with eight small branched spines.” §

### Genus RHINOPALPA. ||

*Rhinopalpa*, Felder, Wien. Ent. Mon. iv. p. 399 (1860); Neues, Lep. p. 49 (1861).

*Eurhinia*, Felder, Reise Nov. Lep. p. 405 (1866).

Anterior wings subtriangular, costal margin very strongly arched and convex, apical angle obliquely truncate and very prominent, beneath which the outer margin is deeply excavated and concave; inner margin more or less concave. First and second subcostal nervules emitted close together near apex of cell,

\* This measurement is that of a limited series only, and variation in size doubtless exists as in other species of the genus.

† It has also been recorded by De l'Orza from Japan, as pointed out by Mr. Elwes (Proc. Zool. Soc. 1881, p. 895).

‡ Ent. Month. Mag. i. p. 132.

§ Lep. Ceyl. i. p. 41. The larva is not figured, but it is probable that Mr. Moore has relied on the information or drawings of some local observer.

|| Felder appears to have subsequently substituted the name *Eurhinia* in place of that of *Rhinopalpa*, which he originally proposed for the genus, and this without comment. Scudder, in his ‘Historical Sketch,’ and revision of generic names (Proc. Am. Acad. Arts & Sci. vol. x. pp. 173 and 262), decides that this course should be followed, on the suggested grounds that the original name was probably a hybrid one. This, however, seems to me a retrograde step, placing the name of the thing before the thing itself, and is not warranted by the “Stricklandian Rules,” which thus deal with the question:—“Compound words whose component parts are taken from two different languages are great deformities in nomenclature, and naturalists should be especially guarded not to introduce any more such terms into Zoology, which furnishes too many examples of them already” (Rules Zool. Nomencl. by H. E. Strickland, 1878, p. 15). This does not warrant the alteration of the name, and in these days when the whole subject is being rendered incomprehensible (except to a few specialists) by the alterations, substitutions, and divisions of the whole generic names, a conservative course wherever possible is to be commended. As Packard well remarks, “The work of the systematic biologist often amounts to little more than putting Nature in a strait-jacket” (Monogr. Geom. Moths, or Phalæn. Un. States, p. 42).

third emitted beneath apex of second and extending to apex of wing, fourth and fifth bifurcating at about one-fourth from apex. Upper disco-cellular nervule short and aborted; lower disco-cellular absent, the cell widely open. Median nervules widely separated, the first prominently rounded at base. Posterior wings subovate, the costal margin obliquely convex, the outer margin waved and sinuate, and produced into a prominent caudate elongation at apex of discoidal nervule. Abdominal margins convex and overlapping near base, and then distinctly concave and slightly divergent to anal angle. Costal nervure arched and extending to apex; discoidal cell with the apex unenclosed; first and second median nervules with a common origin and subparallel, the first slightly rounded. Body short, robust; palpi large and porrect, well separated at their bases, rising considerably above the upper surface of the head, flattened beneath, and terminating in a long, robust, obtuse point.

This is a genus of small extent, of which about eight described species are known, and these of unequal value, several of them being considered by many lepidopterists as varieties only of other species. Its geographical area does not appear (according to present knowledge) to occur west of Tenasserim, and it is recorded from Java, Celebes, Philippines, Amboina, and Papua.

1. *Rhinopalpa fulva*. (Tab. XII., fig. 1 ♂, 2 ♀.)

*Rhinopalpa fulva*, Felder, Wien. Ent. Mon. iv. p. 399, n. 21 (1860); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 1 (1877).

Male. Anterior wings above reddish ochraceous, with a broad fuscous outer marginal border, which is inwardly slightly concave; marginal fringe greyish. Posterior wings reddish ochraceous, with a broad fuscous outer marginal border, narrowing and terminating about discoidal nervule, between which and the anal angle are two submarginal fuscous lines, the outer one broadest and both preceded by three round fuscous spots, situate two between the median nervules, and one between the first median and the discoidal nervules—the colour at the area of these spots is distinctly darker; extreme margin fuscous, with the fringe greyish and a fuscous spot at anal angle posteriorly surrounded with an obovate violaceous margin. Wings beneath fuscous, the basal halves darkest, where they are crossed by two irregular almost concolorous fasciæ, denoted by their margins, which are pale bluish and much waved, sinuated and broken; about centre the wings are also crossed by three contiguous, much-waved and sinuated pale bluish lines, the outer one of which is broken and somewhat indistinct—between these lines the colour is paler, and they are outwardly bounded by a waved fuscous line, which in some places becomes confluent with them; these are followed by a broad irregular dark fascia, and a submarginal row of large rounded ocellated spots with blue and black centres and black margins, and situate between the nervules, six on anterior and five on posterior wings (the lower spot on anterior wings is usually bipupillated); two fuscous submarginal waved lines, which are preceded near costal margin of anterior wings by an irregularly shaped whitish spot, and the inner one of which is margined on each side with pale bluish; beyond these the colour is somewhat dull red, and the marginal fringe is black, interspersed with greyish; on anal angle of posterior wings, which is reddish, is a looped black spot. Body more or less concolorous with wings, legs fuscous, and the underside of the palpi and tibiæ and tarsi obscure ochraceous.

Female. Larger and much paler in coloration than the male; above with the black marginal border of anterior wings broken towards posterior angle, and on the posterior wings not reaching outer margin; the basal third of both wings also appears distinctly darker. Beneath the wings are much paler than in the male, being dull reddish ochraceous at base, and then shading into creamy white and pale ochraceous; the markings are similar to those of the other sex, but of paler and altogether different hue.

Exp. wings, ♂ 58 to 62 millim.; ♀ 72 millim.



HAB.—Tenasserim; Houndrau (Bingham—Brit. Mus.)—Malay Peninsula; Province Wellesley (colls. Dist. and Saüer); Malacca (Pinwill—Brit. Mus.)

The female form here described was collected by Mr. Saüer, and is the only specimen of that sex which I have yet been able to examine. The species is very closely allied to the Javan *R. polymice*, Cram.

**Rhinopalpa? eudoxia.** (Tab. XVII., f. 6.)

*Vanessa eudoxia*, Guérin, Rev. Zool. 1840, p. 44; Deless. Souv. Inde, p. 73, t. 20 (1843).

*Precis eudoxia*, Kirby, Syn. Cat. Diurn. Lep. p. 191, n. 25 (1871).

This insect is only known to me by Guérin's figure, which has been copied in this work, and I have been as yet unable to find a specimen in any collection. The original type was acquired by M. Adolphe Delessert from Malacca during his eastern voyage from 1834 to 1839. Several other insects described by Guérin, which were collected at the same time and locality, are not unfrequently received from the Malay Peninsula, and it is probable that the present species is of a rarer character, being either restricted in locality or of obscure habits, such as of an entirely jungle life.

Its structural appearance (as figured) allies it to the genus *Rhinopalpa*, in which I have placed it; but of course, without examination of its neuration, it can only be placed provisionally in that genus.

I have thought it best to add the very careful description of Guérin Méneville, as originally published:—

“Ses ailes supérieures sont d'un jaune-fauve couleur d'ocre, fortement concaves et dentées au bord externe, d'un brun pâle à la base, avec l'extrémité noirâtre. Les inférieures sont dentées, elles ont une petite queue au milieu du bord externe et un petit prolongement arrondi à l'angle anal. Leur couleur est semblable à celle des supérieures, avec la base également brune et l'angle supérieur externe noirâtre. Elles ont, près du bord, deux lignes sinueuses, précédées de gros points noirs à contour plus pâle que le fond, dont les deux plus externes touchent la tache apicale noire. On voit sur le milieu du lobe de l'angle anal une petite strie oblique bleue. Le dessous est d'un brun jaunâtre; la base des ailes, d'un jaune plus pâle au milieu, augmente de ton vers les bords, avec des lignes en zigzag blanches à reflets violacés et d'autres lignes brunes et transversales. Les lignes blanches du milieu et celles qui longent le bord externe sont plus larges et mieux marquées. Il y a, en outre, au côté interne des lignes blanches du bord des quatre ailes une ligne d'yeux brun bordé de noir et pupillé de bleu. On compte six de ces yeux aux ailes supérieures et cinq aux inférieures. La frange est alternativement noire et blanche des deux côtés. Le corps est d'un brun jaunâtre, les antennes noires.”

“Hab. la côte Malaye.”

Genus EULACURA.

*Eulaccüra*, Butler, Proc. Zool. Soc. 1871, p. 726.

*Eulacura*, Scudd. Proc. Am. Acad. Arts & Sc. vol. x. p. 170 (1875).

*Eulacura*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541 (1877).

Anterior wings subtriangular and elongate, the costal margin slightly arched and convex, the apical angle produced and rounded, beneath which the outer margin is sinuated and concave; inner margin

nearly straight. First and second subcostal nervules emitted close together near end of cell, the second much longer than the first; third emitted some distance before the apex of the second and extending to apex, before which it is prominently curved and rounded; fourth and fifth bifurcating at about one-fourth from apex; upper disco-cellular nervule short and angled; lower disco-cellular absent, leaving the apex of the cell entirely open; first median nervule strongly curved near base, where it has an apparently common origin with the second. Posterior wings subovate, the costal margin nearly straight, the outer margin convex and slightly waved; abdominal margins well separated, slightly convex towards base and then obliquely divergent to anal angles. Costal nervule sinuated and curved upwards near base, and then continued to apex. Discoidal cell open; discoidal nervule emitted a short distance from base of second subcostal nervule; first median nervule curved and rounded near base, where it has a common origin with the second; both first and second are considerably shorter than the third. Body short, the thorax robust; antennæ long, slender, the club compressed.

This genus is a Malay representative of the large and widely-spread genus *Apatura*,\* to which it is somewhat closely allied. But one species is at present known, and its geographical range appears limited.

**1. *Eulacura osteria*.** (Tab. XII., fig. 5 ♂, and 6 ♀.)

*Apatura Osteria*, Westwood, Gen. Diurn. Lep. p. 305, n. 19, note (1850).

*Eulaceïra Osteria*, Butl. Proc. Zool. Soc. 1871, p. 726; Druce, *ibid.* 1873, p. 346, n. 1.

*Eulacura osteria*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541, n. 1 (1877).

Male. Wings above dark glossy fuscous. Anterior wings with a discal oblique series of five white spots, the uppermost and smallest situate above the first median nervule, remaining four larger, contiguous and only separated by the median nervules and submedian nervure. Posterior wings with a corresponding but broader oblique series of subquadrate spots, which form a continuous fascia, although apparently divided by the nervules and terminating about centre of abdominal margin, the basal two-thirds of which is pale greyish; a submarginal row of obscure rounded fuscous spots placed between the nervules, and two narrow fuscous marginal lines. Wings beneath pale silvery bluish, both wings crossed by the pale discal oblique series of spots, forming a more continuous fascia than above, and silvery white inwardly margined with ochraceous; two narrow ochraceous fasciæ crossing cell of anterior wing; outer margins of both wings and apex of anterior wings bordered and suffused with ochraceous, and two ocellated spots (ochraceous with bluish and black centres), the first on anterior wing situate between the second and third median nervules, the second spot situate between the second and third median nervules of the posterior wings. Body and legs more or less concolorous with wings.

Female. Pale brownish. Anterior wings with two dark fasciæ crossing cell and with a very broad pale submarginal fascia, the outer margin of which is denoted by a series of lunulate white spots, and the inner margin—which is directed outwardly from subcostal nervure to first median nervule and then obliquely reflexed—is marked by a series of irregular white spots; and an indistinct ocellated spot between the second and third median nervules. Posterior wings with a narrow pale oblique macular fascia (continuous to the inner margin of the broad fascia of anterior wings) obscurely terminating about middle of submedian nervure; an ocellated spot between second and third median nervules, and a waved and strongly lunulated ochraceous submarginal fascia, inwardly enclosing obconical fuscous spots, excepting between the second and third median nervules and from thence to anal angle; two fuscous marginal lines and basal area of

\* By the name *Apatura* I allude to the genus as hitherto almost universally understood, and not as recently applied by Messrs. Scudder and Moore to species of *Hypolimnas*. Where an earlier generic name is clearly found to have priority the law should unhesitatingly be applied; but where a certain amount of doubt exists, and the evidence is not convincing, the name generally used should remain unchanged.

abdominal margin pale as in male. Wings beneath a little darker and more ochraceous than in male; other markings generally the same.

Exp. wings, ♂ 65 millim.; ♀ 63 millim.

HAB.—Malay Peninsula; Province Wellesley (colls. Dist. and Sauer); Malacca (Pinwill—Brit. Mus.); Singapore (Westw.)—Java (Westw.\*)—Borneo (Druce).

### Genus CHARAXES.

*Charaxes*, Ochseneimer, Schmett. Eur. iv. p. 18 (1816); Feld. Neues Lep. p. 39 (1861); Moore, Lep. Ceyl. i. p. 28 (1881).

*Eriboa*, Hübn. Verz. bek. Schmett. p. 46 (1816).

*Eulepis*, Dalm. in Billb. Enum. Ins. p. 80 (1820); Moore, Lep. Ceyl. i. p. 29 (1881).

*Nymphalis*, Westw. (nec. Latr.), Gen. Diurn. Lep. p. 306 (1850).

*Haridra*, Moore, Lep. Ceyl. i. p. 30 (1881).

Anterior wings subtriangular, the costal margin arched and convex, the apex elongately produced and rounded or subacute, the outer margin deeply concave and slightly and irregularly waved, the inner margin nearly straight. First and second subcostal nervules emitted close together near end of cell, third a short distance beyond end of cell and extending to apex, where it is slightly rounded and convex, fourth and fifth bifurcating at about one-third beyond end of cell, the fourth suddenly deflexed and slightly concave near apex. Upper disco-cellular short and angled, the lower slender and curved. Median nervules situate wide apart, the first strongly curved and rounded near base. Posterior wings subovate, the costal margin strongly curved and convex, the outer margin convex, regularly and distinctly waved and produced in more or less well-developed narrow caudate prolongations at apices of first and third median nervules (in some specimens the last is either but rudimentary or practically obsolete). Abdominal margin strongly and convexly angulated at base, and then obliquely divergent to anal angle. Costal nervure strongly curved and extending to apex; precostal nervure suberect, its apex more or less curved; bases of subcostal nervules and discoidal nervule about equally wide apart; discoidal cell imperfectly closed at apex with a more or less aborted and indistinct disco-cellular nervule (in some specimens this is practically obsolete, and the cell completely open). First median nervule strongly curved near base (in some specimens the first and second median nervules are wider apart than the second and third). Body short; thorax very robust; antennæ stout and prominently clavate at apex.

The genus *Charaxes*, from its wide distribution, and the beauty of its species, combined with their strength of wing and body, forms one of the most interesting genera of the *Nymphalineæ*.

One species is found in Europe, round the shores of the Mediterranean, which has a very close ally in an Abyssinian species. The genus also inhabits Eastern, Western, and the warmer portions of Southern Africa. It is apparently in Western Tropical Africa that *Charaxes* is found in its maximum of size, beauty, and abundance of species, though the neighbourhood of Delagoa was recently pronounced by Mr. Hewitson to be the "head-quarters" of the genus.† Madagascar possesses some very distinct species, and travelling eastward the genus

\* Gen. Diurn. Lep. p. 305.

† Ent. Month. Mag. xiv. p. 81. In estimating what is really the "head-quarters" of a genus, we may apply the axiom of that excellent mammalogist, Mr. J. A. Allen, viz.:—"The largest species of a group (genus, subfamily, or family as the case may be) are found where the group to which they severally belong reaches its highest development, or where it has what may be termed its centre of distribution" (Bull. U.S. Geol. & Geogr. Surv. ii. p. 310). These conditions are, for *Charaxes*, fulfilled in Western Tropical Africa.

has recently been discovered in the Island of Socotra by Prof. Balfour. It is common in Continental India, found in Ceylon and the Andaman Islands (it has not yet been recorded from the Nicobars), occurs throughout Burma, Tenasserim, and the Malay Peninsula, Eastern Asia, as far north as China, and through the length and breadth of the Malayan Archipelago. Its distribution in the Pacific Islands appears at present very limited, but it is found in Australia.

The species possess strong flight and frequent lofty positions in trees. In South Africa Mr. Trimén describes them as delighting "to settle on the stems of lofty twigs of timber trees,"\* and the male of a species in Ceylon, according to Mr. Wade, is "most frequently found perched high up on acacia trees."†

Another peculiarity is recorded from widely separated habitats. Thus the European species is stated to have "a great preference for the same spot or twig, and you may find it day after day, when at rest, on its favourite twig or branch."‡ This is corroborated by Mr. Trimén in S. Africa, where he relates that species, "even when roughly scared from their seat," will return to the same position.§

The smooth spineless larvæ with bifid tails ally *Charaxes* superficially with the *Satyrine*, as already pointed out (*ante*, p. 37); but our present knowledge of the transformations of the genus is confined to three or four species only.

Based on the views of Mr. Scudder, proposals have recently been made to split this large and widely distributed genus into a number of less well-defined "genera."

If the end of the study of Rhopalocera was merely to attain an artificial method of cabinet arrangement by means of a surcharged nomenclature, then, however difficult to a non-specialist, the course would have to be adopted, and there could be little objection to a farrago of generic names. But if, on the other hand, such action would tend to obscure our knowledge of the real affinities and geographical distribution of a genus as at present understood,—and this particularly applies to *Charaxes*,—what is the advantage of such systematic dissection? ||

The objection particularly applies when a widely distributed genus like *Charaxes* undergoes this generic splitting process in one geographical group of its species only. For instance, if this is done with the Oriental species alone, without reference to those of the Ethiopian and Australian regions, all ideas as to geographical distribution are reduced to chaos. Either these new genera founded on Oriental species do or do not also contain species found in the other regions, and I think it would not be a vexatious rule to require that when a hitherto well-known genus is broken up into other genera, the systematist who undertakes the work, should also examine the other species of the genus,—as then understood and from whatever



FIG. 37.—Larva of *C. athamas*, var. *samatha*, from Moore's Lepid. Ceyl.

\* Rhop. Afr. Austr. p. 166.

† Moore's Lep. Ceyl. i. p. 30.

‡ Quoted on the authority of W. F. de V. Kane in Kirby's 'Europ. Butt. & Moths,' p. 26.

§ Rhop. Afr. Austr. p. 166.

|| That veteran entomologist, and more especially coleopterist, Dr. Le Conte, has remarked this disturbing element in the study of his own order, and, to use his own words:—"In all entomological investigations relating to geographical distribution we are greatly embarrassed by the multitude of species, and by the vague and opinionative genera founded upon characters of small importance" (Proc. Am. Ass., Detroit, 1879, p. 7).

region,—and state the specific extent and range of his proposed new genera. The few facts of geographical distribution which we possess, and which have been formulated on the labours and decisions of the systematist, with the general concurrence of specialists, ought not to be invalidated by the hasty erection of new genera for a few species without reference to the whole.\*

A. Outer margins of posterior wings caudately and prominently produced at apices of first and third median nervules.

1. *Charaxes echo*. (Fig. 38.)

*Charaxes Echo*, Butler, Ann. & Mag. Nat. Hist. ser. 3, vol. xx. p. 400, t. 8, figs. 5, 6 (1867); Druce, Proc. Zool. Soc. 1873, p. 346, No. 1.

*Nymphalis fabius*, var. C, Kirby, Cat. Diurn. Lep. p. 269 (1871).



FIG. 38.

As this species is only known to me by an uncoloured figure, which is here reproduced, it is better to give the original Latin diagnosis of its describer:—

“Alæ supra nigro-fuscae, ad basin paulum viridescentes: anticæ serie macularum septem decreescentium fulvarum discali; maculis duabus pone cellam oblique positis punctisque tribus marginalibus analibus fulvis: posticæ fascia tenui media, punctis septem ovalibus submarginalibus undecimque angularibus marginalibus fulvis; margine interno fusco-grisescente: corpus thorace nigro-fusco, abdomine fusco: antennis nigris.

“Alæ subtus roseo-albicantes, extus paulum fuscrescentes: anticæ lineis tribus discoideis duabusque infra cellam nigris; maculis discalibus velut supra, intus autem nigro limitatis; macula superna pone cellam extensa fasciolam formante; maculis submarginalibus serie positis (apud angulum ani solum distinctis), omnibus flavis: maculis duabus tribusve, cum iis subanalibus junctis, ovalibus, nigris, anali geminata: posticæ areola basali et fascia media albidis nigro limitatis, hac quoque argenteo intus marginata; maculis septem lunulatis ferrugineis, tribus inferioribus majoribus magis rufescentibus, omnibus intus cyaneo-albo cinctis et nigro limitatis; linea subanali nigra; maculis septem marginalibus cæruleis nigro lineatis extus fulvo et intus albo limitatis: corpus ochraceum, thoracis medio palpisque albicantibus; antennis nigris.

“Exp. alar. unc.  $2\frac{1}{2}$ .”

HAB.—Malay Peninsula; Singapore (coll. Roberts).—Borneo (Druce).

\* The artificiality of many genera has been well pointed out by Weismann, who also observes, “If we see two species of butterflies quite dissimilar in form of wing and other characters, we should be inclined, in spite of many points of agreement between them, to place them in entirely different genera. But should we then find that not only did their adult larvæ agree in every detail of marking, but also that the entire phyletic development of these markings, as revealed by the ontogeny of the larvæ, had taken precisely the same course in both species, we should certainly conclude that they possessed a near blood-relationship, and should place them close together in the same genus” (‘Stud. in Theory of Descent,’ Engl. Transl., p. 170).

Erroneous views have obtained in Anthropology as to the stage of culture denoted by a recognition of a “genus” of natural objects. Thus Dr. Peschel (‘The Races of Man,’ p. 6) writes, “In nations which have remained at a low stage of civilization, we find names for different species of oaks, but none for the genus oak.” This has been refuted by Dr. Hector (Brit. Ass., Bristol, 1875), who testified that the Maories have not only distinct names for nearly all their plants, but generic names by which they grouped plants according to their affinities, in a way impossible to most people who were not educated botanists.

This is a so-called "variety," or more correctly designated "local race," of *C. fabius*, Fabr., a species found in Continental India and Ceylon. Several other of these closely allied forms or "local races" have been described,\* and although the exigencies of cabinet arrangement and systematic nomenclature may require that these forms should be capable of reference under distinct names, it is surely disguising a certain fact in Nature if we do not admit that they must have had a common progenitor, and that their fixity in local races or species is due to dispersion and isolation. (When we use these two words a difference of the surrounding conditions is naturally postulated.) Of course other local and somewhat intermediate races may have failed to sufficiently establish themselves, and have early succumbed to unfavourable conditions. As Blumenbach observed, "Every paving-stone in Göttingen is a proof that species, or rather whole genera, of creatures must have disappeared." †

## 2. *Charaxes schreiberi*. (Tab. XIII., fig. 2 ♂.)

*Nymphalis Schreiber*, Godart, Enc. Méth. ix. Suppl. p. 825 (1823).

*Paphia Schreibers*, Horsf. Cat. Lep. E. I. C. t. 6, f. 3, 3a (1829).

*Nymphalis Schreiberi*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 205, n. 418 (1857).

*Charaxes Schreiberi*, Druce, Proc. Zool. Soc. 1873, p. 346, n. 2; Snellen, Tijds. Ent. xix. p. 147, n. 20 (1876);  
Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539, n. 3 (1877); Godm. & Salv. Proc. Zool. Soc. 1878,  
p. 640, n. 22.

Male. Wings above dark fuscous, the basal third somewhat tinged with bluish; disk of both wings crossed, by a central discal white fascia, commencing on anterior wings immediately beneath first median nervule and terminating on posterior wings in a subacute point near the first median nervule; on anterior wings this fascia is narrowly margined with pale bluish from beneath the third median nervule, and from the same nervule is outwardly very broadly and somewhat dentately margined with the same colour; on posterior wings the white fascia terminates in a pale bluish fascia which is inwardly straight and outwardly emarginate, and crosses the wing, terminating very narrowly at anal angle; anterior wings with a white spot placed between the discoidal nervules, and posterior wings with a submarginal series of small whitish spots placed between the nervules, two between the third median nervule and submedian nervule, and a pale bluish narrow submarginal but broken fascia commencing at about discoidal nervule, which become ochraceous at anal angle; abdominal margin pale greyish at base. Wings beneath pale silvery white; both wings crossed by a dull ochraceous fascia margined with blue; on anterior wings this fascia crosses the end of cell, where it is outwardly bifurcate and terminates, obtusely rounded a little beneath the third median nervule; on posterior wings the fascia commences at costa and terminates a little beyond third median nervule; anterior wings with two dark bluish spots in cell; an irregularly shaped carmine spot beyond the central fascia between the lower discoidal and the second median nervules; a submarginal series of somewhat lunulate spots placed between the nervules, which are obsolete near apex, and suffused with black near outer angle, the lower three being preceded by a lunulate dark line, and the outer margin broadly infuscated; posterior wings with a broad submarginal pale fuscous fascia, on the inner margin of which are a series of carmine lunulate spots, the upper three of which have a pale area and are preceded by a continuous bluish line, and the lower and larger three are inwardly margined with white and blue, the one at anal angle being preceded by a transverse dark bluish streak, and a marginal ochraceous fascia, the borders of which are bluish. Body more or less concolorous with wings; posterior and intermediate femora much suffused with blackish shadings; tibiæ and tarsi ochraceous.

\* One from Celebes and two from unknown localities.

† 'Anthropological Treatises,' Engl. transl. p. 283 (1865).

Female. Resembling the male, but with the central white fascia to the wings above only faintly and slightly margined and followed by pale blue, and the marginal fascia to posterior wings more ochraceous and continued to apex; on anterior wings is an additional small white subapical spot placed above the upper discoidal nervule.

Exp. wings, ♂ and ♀, 95 to 98 millim.

HAB.—Malay Peninsula; Malacca (colls. Brit. Mus. and Dist.)—Billiton (Godm. & Salv.)—Java (coll. Horsf. and Brit. Mus.); Batavia (Snellen).—Borneo (colls. Dist. and Godm. & Salv.)

This species appears to be confined to the true Indo-Malayan region. It has not yet been recorded from Tenasserim, and probably does not extend northward or westward of the area here faunistically treated.

### 3. *Charaxes delphis*. (Tab. XV., fig. 1 ♂.)

*Charaxes Delphis*, Doubleday, Ann. Soc. Ent. France, 1843, p. 217, t. 7.

*Charaxes Concha*, Voll. Tijds. Ent. iv. p. 162, t. 10, f. 1, 3 (1861).

Male and Female. Wings above pale stramineous. Anterior wings with the costal area slightly infuscated; a small black streak on upper portion of disco-cellular nervules, and the whole apical third black; the inner margin of this black area is much waved, and commencing at costa near end of cell really and narrowly terminates at apex of third median nervule, but is apparently continued by two elongate spots, which do not pass the submedian nervure, and do not quite reach the outer margin. Posterior wings with a submarginal series of greenish lunulate spots placed between the nervules, continued as streaks to the apices of the nervules, especially prominent and distinct along the three median nervules. (Some markings of the under surface show more or less distinctly near posterior angle of the anterior wings, and on disk of posterior wings.) Wings beneath pale silvery white; anterior wings with the apical third somewhat darker (reflecting the black area of the upper surface); two small and irregularly shaped bluish black spots in cell; a lunulate blue spot with black margins at end of cell, outwardly followed by a contiguous black streak; a narrow black streak above and beneath the upper discoidal nervule; a rounded blue spot with blackish margins beneath cell and between second and third median nervules, and an outer submarginal series of lunulate bluish markings, outwardly followed by a series of ochraceous spots. Posterior wings with a blue spot with blackish margins on about centre of costal area, three curved blackish lines (diminishing in size) in and near end of cell, a short linear mark of the same colour on each side of the third median nervule, and two similar ones on abdominal margin, about one-third from anal angle; a discal series of bluish lunulate spots placed between the nervules, closely followed by a series of dark ochraceous spots, and again by a much-waved pale ochraceous fascia; a submarginal series of bluish elongate and linear spots placed between the nervules, and a marginal corresponding series of rather larger ochraceous spots; caudate appendages streaked with bluish. Body above with the abdomen more or less concolorous with wings, the thorax and head infuscated; thorax beneath concolorous with wings, the legs dull greyish. Antennæ fuscous.

Exp. wings, ♂ 95 millim.; ♀ 100 millim.

HAB.—Continental India; Silhet; Assam (Brit. Mus.)—Tenasserim (Bingham—coll. Moore).—Malay Peninsula; Malacca (Biggs—coll. Gosse).—Borneo; Labuan (Brit. Mus.)

I have not seen this fine species in any of the Province Wellesley collections that have passed through my hands; but Mr. Gosse possesses both sexes from Malacca, collected there by the Rev. L. Biggs, the male specimen of which I have been allowed to figure here.

4. *Charaxes athamas*, var. *samatha*. (Tab. XIII., fig. 8 ♂.)

*Papilio Athamas*, Drury, Ill. Ex. Ent. i. t. 2, f. 4 (1773); Cram. Pap. Ex. i. t. 89, C, D (1779).

*Charaxes samatha*, Moore, Proc. Zool. Soc. 1878, p. 831.

*Eulepis samatha*, Moore, Lep. Ceyl. i. p. 29, t. 14, f. 2, a, b (1881).

Male and Female. Wings above dark chocolate-brown; both wings crossed by a broad pale greenish yellow fascia, commencing on anterior wing beneath the first median nervule, where it is narrowest on that wing, and terminating narrowly and subacutely at the middle of the third median nervule of the posterior wing; anterior wings with a pale greenish subapical rounded spot placed between the discoidal nervules (in some specimens there is a second and smaller white spot), and posterior wings with a submarginal series of whitish spots placed between the nervules (two distinctly surrounded with black between the third median nervule and submedian nervure), and a narrow pale brownish marginal line. Wings beneath olive-brown, with bright pink reflections; both wings crossed by a broad pale shining, greenish fascia (equivalent to the one on the upper surface), inwardly margined by a narrow castaneous fascia with blackish borders; on anterior wings this fascia is margined with castaneous above, and is outwardly narrowly margined with the same colour, which is followed by a series of sublunulate spots denoted by their fuscous margins, placed between the nervules, the hindmost of which, situate between the third median nervule and submedian nervure, is largest and much suffused with black; a small black dot in cell, and the pale greenish spot between the discoidal nervules as above, but inwardly margined with black. Posterior wings with the fascia outwardly margined as on anterior wings, but with the accompanying spots less regular; these consist of a small black spot at costa, an irregular black patch beneath the costal nervure enclosing a castaneous spot, a castaneous spot above the lower subcostal nervule, and a smaller one beneath it, an irregular black streak beneath the discoidal nervule, and a lunulate black spot on each side of the second median nervule: these are preceded by shining greyish streaks; a castaneous spot more or less surrounded with black near anal angle, preceded by a blackish transverse line; a submarginal series of small fuscous spots more or less surrounded with greyish white placed between the nervules, two being situate at anal angle between the third median nervule and submedian nervure; these spots are followed by pale brownish, the extreme margin being fuscous. Body and legs more or less concolorous with wings.

Exp. wings, ♂ 63 to 65 millim.; ♀ \* 78 millim.

HAB.†—N.E. India (Brit. Mus.)—Ceylon (coll. Moore).—Burma.—Upper Tenasserim (Brit. Mus.)—Malay Peninsula; Province Wellesley (coll. Dist.).

I incline to the opinion that this form should be considered a variety of *C. athamas*. Mr. Moore, in his description of *C. samatha*, ‡ describes it as having the "yellow band on both wings one-third less in width" than in "Indian examples of *C. athamas*," and he afterwards figures his species in the 'Lepidoptera of Ceylon.' Now if we compare these figures with that of Drury, § who originally described and figured *C. athamas*, instead of finding the yellow band of *C. samatha* "less in width" than in Drury's species, it is, on the contrary, always as broad, and at its apices on both wings *absolutely broader*. || There therefore only remains its somewhat

\* As figured in Moore's Lep. Ceyl. i. t. 14, f. 2a.

† It is certain that the range of this variety is much more extensive than the following localities indicate; but owing to the impossibility of knowing whether some authors who refer to *C. athamas* mean that species (typical) or its present variety, it is impossible to give their habitats on the present occasion, when the var. *Samatha*, Moore, is alone referred to.

‡ Proc. Zool. Soc. 1878, p. 831.

§ Ill. Ex. Ent. i. t. 2, f. 4.

|| There is a probable explanation of this discrepancy, as Mr. Moore (well known as our highest authority on Indian Lepidoptera) expressly refers to Indian examples of *C. athamas*, whilst Drury described his species as from China.



smaller size, the frequent absence of the apical spot, and the generally (in the male) smaller size of the subapical spot to differentiate it.

We are indebted to the Bros. de Alwis for a drawing of the larva of this species as found in Ceylon,\* which is reproduced here (*ante*, p. 102, fig. 38), and Dr. Horsfield had previously given a figure† representing the larva of the Javan form of *C. athamas*,‡ which differs only from the first by the absence of the "oblique yellowish white stripe" from the eleventh segment—a difference which may or may not merely represent a different stage of growth in the caterpillar, and hence a different stage in the developmental markings. In Ceylon it is stated to feed on "*Cesalpinia*." §

Of the habits of the typical form of *C. athamas* in N.W. India we have a few particulars from Capt. Lang.|| It is "an insect of extremely rapid flight, flashing like lightning up and down rocky-bedded streams in Himalayan glens (3000 to 5000 ft.). It pitches on rocks in mid-stream, and flashes off again if approached. It is not common, and very difficult to capture; yet one very hot day in June I saw seven individuals sitting with closed wings, motionless, on a foul spot (by the damp sandy margin of a stream¶), so close together that I might have put my hat over all of them."

##### 5. *Charaxes hebe*. (Tab. XV., fig. 2 ♂.)

*Charaxes Hebe*, Butler, Proc. Zool. Soc. 1865, p. 634, n. 46, t. 37, f. 3; Druce, Proc. Zool. Soc. 1873, p. 346, n. 4; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539, n. 2 (1877).

Male and Female. Wings above very pale greenish. Anterior wings with the base, cell, and base of costal area greyish brown; apical half blackish, with a small pale greenish spot between the discoidal nervules; this black apical area is much waved internally, commencing near end of cell it is obliquely and outwardly directed, becoming prominently concave at the median nervules, and somewhat narrowly terminating at the posterior angle. Posterior wings with the base greyish brown, and in some specimens (as the one figured) a darker marginal border containing a marginal series of fuscous spots inwardly marked with white streaks placed between the nervules (the one at anal angle marked with two white spots); in other specimens these markings are much paler and somewhat indistinct; extreme margin and margins of caudate appendages dark green. Wings beneath reddish brown, both wings crossed by a broad pale shining greenish fascia, inwardly margined by a narrow castaneous fascia with blackish borders; on the anterior wings the greenish fascia commences at end of cell, immediately beneath the first median nervule, and is broadly margined with castaneous above, which forms a subtriangular patch extending to upper

\* Lep. Ceyl. i. t. 14, fig. 2 b.

† Descript. Cat. t. viii. f. 7.

‡ This Javan form of the species is probably the variety described by Felder under the name of *C. attalus* (Reise Nov. Lep. iii. p. 438, n. 711).

§ Lep. Ceyl. i. p. 30. The genus *Cesalpinia* consists of trees or shrubs growing in the tropical parts of Asia, Africa, and America, thus agreeing roughly with the distribution of *Charaxes*, as in Tropical America an allied genus *Megistanis* is found (some authors, as Vollenhoven, have described species of this genus under the name of *Charaxes*). *Cesalpinia* includes plants possessing both chemical and medicinal properties; for example, the Oriental *C. sappan*, which yields the well-known red dye; whilst, according to Dr. Hogg ('Indian Notes,' p. 217), another species, "*Cesalpinia sepiaria-rehme*," the "Mysore thorn, a prickly-hedge climber with yellow flowers," possesses astringent wood, and its bruised leaves are applied as a cure for burns. Mr. R. Spruce, in his botanical investigations in the Amazon Valley, found that "some caterpillars seem to have a decided taste for bitters; and narcotics are rarely objected to" (Journ. Linn. Soc., Zool. vol. ix. p. 354).

|| Ent. Month. Mag. i. p. 181.

¶ These are always favourite spots for Rhopalocera. Some Lepchas who in Sikkim make what they can by catching insects and selling them to visitors, take advantage of the known partiality of butterflies for wet sand. Mr. de Nicéville states that "in one place upon a large flattish stone near the middle of the stream, the men had put some sand and kept it watered, and it was surprising the number of butterflies that came to their 'trap' and were caught" (Journ. Asiat. Soc. Bengl. vol. li. pt. ii. p. 54 (1882)). These habits may be of use to the explorer, as when Command. Cameron states that he "always found" butterflies in a dry country "as sure sign that water was near" ('Across Africa,' vol. i. p. 130).

discoidal nervule, where it contains a small greenish spot; the pale fascia is outwardly narrowly margined with castaneous, and followed by a series of castaneous lunulate spots (in pale specimens the margins of the spots only are castaneous) placed between the nervules, with an additional blackish spot above the submedian nervure. Posterior wings with the central pale fascia narrower, outwardly concave from costa to first median nervule, and angularly terminating at third median nervule, outwardly and narrowly margined as on anterior wings; this margin is widened between the costal nervure and first subcostal nervule, where it is more or less marked with fuscous, followed by a castaneous spot placed on each side of the lower subcostal nervule, and becoming very broad at the area of the median nervules, where it contains two whitish linear spots, and is outwardly margined with fuscous; it is then again narrowed and continued to abdominal margin near anal angle, where it is preceded by two transverse and contiguous blackish lines; a marginal series of small dark spots placed between the nervules, the caudate appendages margined as above. Body above somewhat infuscated, beneath more or less concolorous with wings.

Exp. wings, 70 to 72 millims.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Biggs—coll. Gosse).—Sumatra (Brit. Mus.)—Borneo (Druce).

The specimen figured was collected by the Rev. L. Biggs in Malacca, and is contained in the collection of Mr. P. H. Gosse. It is interesting as showing the varietal character of the colour of the marginal spots to the posterior wings. In a Province Wellesley specimen in my own collection these spots are as pale as in the Sumatran type figured by Mr. Butler.\*

#### 6. *Charaxes moori*, † n. sp. (Tab. XIII., fig. 3 ♂.)

Male. Wings above as in *C. hebe*, but anterior wings with the apex narrower and less produced, the outer black marking narrower, not extending so far inwardly on disk and at area of median nervules, and not prominently narrowing at posterior angle; its inner margin much waved. Posterior wings with the dark submarginal spots with white centres as in the *var.* of *C. hebe* here figured (Tab. XV., f. 2), but prominently widened into a large blackish patch near apex. Wings beneath as in *C. hebe*, but with the central pale fascia to both wings much broader, thus approaching the outer margins much more closely than in Butler's species; the ground colour is also considerably tinged with steely blue.

Exp. wings, ♂ 68 millim.

HAB.—Malay Peninsula; Province Wellesley (colls. Dist. and Säuer).

I have seen none but male specimens of this species. I first captured a specimen myself thirteen years since, and have lately received another from the same locality. It is also contained in Mr. Säuer's collection. Its natural position is intermediate between the previously described species, *C. hebe*, Butl., and the following species, *C. jalysus*, Feld.

#### 7. *Charaxes jalysus*. (Tab. XIII., fig. 4 ♂.)

*Charaxes Jalysus*, Felder, Reise Nov. Lep. iii. p. 438, n. 714, t. 59, f. 5 (1866); Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539, n. 1 (1877).

*Charaxes jalasus*, Druce, Proc. Zool. Soc. 1873, p. 346, n. 5.

Male. Wings above as in *C. moori*, but paler; the anterior wings with the black apical area considerably smaller, its inner margin nearly straight. Posterior wings with the submarginal border

\* Proc. Zool. Soc. 1865, t. xxxvii. f. 3.

† This species is named after the late Mr. J. H. Moor, for some time Editor of the 'Malacca Observer,' 'Singapore Chronicle,' and 'Singapore Free Press,' but better known as the industrious and competent compiler of that useful and now scarce publication, 'Notices of the Indian Archipelago and Adjacent Countries,' &c.

of spots more continuous and amalgamated, but not dilated into a distinct patch at apex. Wings beneath paler and with the pale central fascia very broad and occupying the whole disk of both wings; on posterior wings this fascia is almost straight outwardly, and not concave from costa to first median nervule as in *C. hebe* and *C. moori*.

Exp. wings, 68 millim.

HAB.—Malay Peninsula; Province Wellesley (Dist.—coll. Butl.); Malacca (Pinwill—Brit. Mus.—coll. Dist.)—Borneo (Druce).

This species appears to be moderately rare in Province Wellesley; one specimen which I captured myself, and which is now in the possession of Mr. Butler, being the only example I have seen from that locality. It is, however, not uncommon in Malacca.

B. *Outer margins of posterior wings caudately and prominently produced at apex of first median nervule only.*

### 8. *Charaxes harpax*. (Tab. XIII., fig. 1 ♂.)

*Charaxes Harpur*, Felder, Reise Nov. Lep. iii. p. 444, n. 725 (1866); Druce, Proc. Zool. Soc. 1873, p. 347, n. 10; Moore, Proc. Zool. Soc. 1878, p. 832.

Male. Wings above reddish ochraceous. Anterior wings with two small contiguous black spots at upper end of cell; apex and outer margin broadly black; this black area has its inner margin sinuous and emarginate, it is broadest inwardly and most angulated beyond cell, and commences to diminish in width beneath the lower discoidal nervule, till it narrowly terminates at posterior angle. Posterior wings with a submarginal row of black spots placed between the nervules (two at anal angle more or less suffused with grey) and with a black apical patch. Wings beneath pale castaneous with steely reflections. Anterior wings with the basal half crossed by four wavy black lines commencing near the subcostal nervule, the two inner ones crossing cell about centre, and continued on posterior wings, terminating near base of internal nervule; the third commencing a little before, and the fourth some distance beyond end of cell (where there is a terminal black line and a linear ovate black marginal spot), between which the colour is distinctly darker, and continued and terminating on posterior wings at internal nervule (between these on posterior wings is a curved terminal line to cell); these are followed by a discal and much-waved line of the same colour, followed on posterior wings by an oblique bluish black fascia, which becomes almost fused with the termination of the discal line near anal angle, where there is a large blackish spot; anterior wings with an apical greyish spot and an indistinctly dentate submarginal greyish fascia inwardly preceded by a few more or less distinct dark spots; posterior wings with a submarginal row of bluish spots placed between the nervules and preceded by transverse greyish streaks (two of these spots at anal angle). Body more or less concolorous with wings; posterior and intermediate femora thickly spotted with black.

Exp. wings, ♂ 90 millim.\*

HAB.—Tenasserim; near Meetan, Moolai (Moore).—Malay Peninsula; Province Wellesley (coll. Sailer).—Borneo (colls. Dist., Godm. & Salv., and Brit. Mus.).

A single male specimen captured by Mr. Sailer in Province Wellesley, and which is here figured, is the only example I have seen from that locality. It is, however, recorded by Mr. Moore from Tenasserim, a locality from which that entomologist has described a closely allied form under the name of *C. aqua*,† between which and typical Bornean examples of *C. harpax* the form here figured is intermediate. Consequently we must allow for variation in these tawny *Charaxes*, where no distinct local race has become differentiated.

\* This is the expansion of the specimen figured from Province Wellesley and of Bornean males in my own collection, though I possess others (unfortunately with no locality) which are much smaller.

† Proc. Zool. Soc. 1878, p. 832.

## Genus PROTHOE.

*Prothoe*, Hübner, Samml. Ex. Schmett. (1816—1841); Westw. Gen. Diurn. Lep. p. 266 (1850).

Anterior wings subtriangular, the costal margin arched and convex, the apex rounded and non- or sub-prominent, the outer margin nearly straight, or more or less concave about the centre, and in some species distinctly waved. Costal nervure short, somewhat suddenly reflexed to costa a little beyond end of cell; first and second subcostal nervules emitted before the end of cell, the distance between their bases, and that between the base of second and end of cell being subequal; third emitted at about one-fifth beyond end of cell and extending to apex, its apical third somewhat gibbous or convex; fourth and fifth bifurcating a little beyond the base of third; the fourth deflexed and concave beneath the convex portion of third. Upper disco-cellular nervule short and oblique, middle disco-cellular suberect, lower disco-cellular prominently curved and rounded inwardly at base, and then obliquely continued to apex; median nervules situate wide apart. Posterior wings obovate, the costal margin moderately oblique and convex, the outer margin more or less prominently waved and produced in a broad, spatulate, caudate, outwardly curved prolongation between the first and second median nervules; abdominal margin ample and slightly convex at the body, and then divergent and oblique to anal angle. Precostal nervure suberect and curved inwardly at apex; costal nervure rounded and extending to apex; second subcostal nervule and discoidal nervule with an apparently common origin; discoidal cell completely open. Palpi placed close to the face. Body small; thorax robust. Antennæ with a long and gradually formed club.

*Prothoe* is a Malayan genus, being found throughout the Indo- and Austro-Malayan regions. It does not apparently occur west of Tenasserim, and is found as far east as New Ireland (this is probably not really the eastern limit of the genus, but represents at present the limit of our knowledge).\* Not more than some half dozen species are described, one of which is alone here included. Another species, however, *P. franckii*, Godt., is almost certainly found in the Peninsula, as Mr. Wallace † gives Malacca as a habitat of the species. I have, however, been unable to find a Malaccan specimen, and though Mr. Hewitson subsequently acquired Mr. Wallace's Rhopalocera, the species is not recorded from Malacca in the posthumous Catalogue of the Hewitsonian collection. As it is also recorded by Mr. Moore from Tenasserim, ‡ the probability of its occurring in our region becomes greater.

1. *Prothoe caledonia*. (Tab. XIII., fig. 9 ♂.)

*Nymphalis calydonia*, Hewitson, Exot. Butt. i. p. 86. t. 43, f. 3, 4 (1855).

*Charaxes calydonia*, Butl. Proc. Zool. Soc. 1865, p. 638.

*Prothoe caledonia*, Butl. Proc. Zool. Soc. 1867, p. 874.

*Nymphalis? Caledonia*, Kirby, Syn. Cat. Diurn. Lep. p. 273, n. 58 (1871).

Male. Anterior wings pale sulphur-yellow, with the base very pale bluish, and with rather more than the apical half dark shining fuscous; the inner margin of this blackish coloration commences narrowly at base of costa, and gradually widening obliquely crosses the cell a little beyond the middle,

\* Mr. Butler (Proc. Zool. Soc. 1867, p. 873) recommended that an African species generally known as *Charaxes berenice* should also be placed in this genus. It has, however, structural peculiarities which have warranted M. Mabille (Bull. Soc. Zool. de France, 1876, p. 280) in founding a new genus for its reception, and consequently Africa cannot be considered as a habitat of *Prothoe*.

† Trans. Ent. Soc. 1869, p. 80.

‡ Proc. Zool. Soc. 1878, p. 832. Mr. Moore, in this paper (*ibid.* p. 854) gives also the Malay Peninsula as a habitat of *P. franckii*, which was probably copied from Wallace, as he possesses no specimen from that locality, and, though he kindly searched for me, could find no authority for the same in his notes.

and crossing the second median nervule near its base extends to near the outer margin between the second and third median nervules, after which it is again directed inwardly and is concavely sinuated to near apex of inner margin; an oblique subapical series of four sulphureous spots, the first near costa, the second between the fourth and fifth subcostal nervules, the third above and the fourth beneath the upper discoidal nervule; a somewhat obsolete pale apical spot and a very small bright spot on the second median nervule. Posterior wings very pale bluish, with a broad shining fuscous outer margin, which is widest at apex and narrowly terminates at anal angle; two linear pale greyish marginal spots near apex and apical margin of caudate appendage of the same colour; the costal disk of the wing is somewhat suffused with sulphureous and the abdominal margin is suffused with very pale brownish. Anterior wings beneath dull greyish, beautifully suffused and spotted with bright red and with the following spots and markings:—four spots on costal area above cell, which contains a basal spot, two placed a little before the middle, followed by an irregular macular fascia, and another and somewhat similar one at apex; immediately beyond cell is a broad curved fascia commencing at costa and terminating at apex of median nervule; a triple series of much broken and irregular fasciæ, the outer margin being also fuscous; beneath the second median nervule the colour is sulphur-yellow, becoming paler towards inner margin, with a large irregular fuscous spot near outer angle. Posterior wings of similar hue and shadings, with the following fuscous spots and markings:—a small rounded spot at base, and another near apex of precostal nervule; a short broad curved transverse fascia commencing near base and terminating on basal edge of abdominal margin; a linear streak above and near base of costal nervule; a subquadrate spot, followed by a larger and curved spot beneath the costal nervule; three spots in cell, a small rounded one near base, a similar one near origin of third median nervule, and a transverse spot near its termination; a sinuated row of discal spots, consisting of a small one above and a large one beneath the first subcostal nervule, three in oblique series divided by the discoidal and first median nervules; a conical spot between the second and third median nervules, and an obconical one before the submedian nervule, from which to edge of abdominal margin is a broad fascia; the apical area of wings, which is preceded by a transverse pale fascia, is darker and shaded with greenish, and contains some much-waved and somewhat disjointed series of transverse fuscous fasciæ; outer margin sulphureous, with its extreme border fuscous, a large fuscous patch on the caudate appendage, and a small red spot near anal angle.\* Body above pale bluish grey; thorax beneath more or less concolorous with wings; legs brownish, tibiæ and tarsi more or less pale ochraceous; antennæ fuscous above, castaneous beneath.

Exp. wings. ♂ 103 millim.

HAB.—Malay Peninsula; Malacca (Wallace, and coll. Roberts).—Borneo (coll. Hewits).—Labuan (coll. Godm. & Salv.)

This beautiful species almost merits the enthusiastic eulogy of its describer, "This glorious butterfly is beyond description." † It was originally discovered by Mr. Wallace, who thus records its capture at Ayer-panas:—"I was one afternoon walking along a favourite road through the forest, with my gun, when I saw a butterfly on the ground. It was large, handsome, and quite new to me, and I got close to it before it flew away. I then observed that it had been settling on the dung of some carnivorous animal. ‡ Thinking it might return

\* These are the most prominent markings on the posterior wings, it being impossible to describe all that the figure faithfully portrays.

† Hewitson, 'Exotic Butterflies,' i. p. 86.

‡ Similar substances are attractive to some of the most handsome butterflies. The beautiful *Apatura iris* in this country has been observed by Mr. Hewitson to frequent the droppings of swine, and by Mr. Sturgess to be partial to dead stoats and weasels, &c. (see Newman's 'British Butterflies,' p. 75). At St. Paulo on the Upper Amazons, Mr. Bates found a species of the handsome genus *Batesia* (*Pandora*) to be attracted by "offal" (Proc. Ent. Soc. 1858-9, p. 22).

to the same spot, I next day after breakfast took my net, and as I approached the place was delighted to see the same butterfly sitting on the same piece of dung, and succeeded in capturing it. . . . I never saw another specimen of it, and it was only after twelve years had elapsed that a second individual reached this country from the north-western part of Borneo."\*

### Genus SYMPHÆDRA.

*Symphædra*, Hübner, Verz. bek. Schmett. p. 39 (1816); Westw. Gen. Diurn. Lep. p. 294 (1850); Moore, Lep. Ceyl. i. p. 31 (1881).

*Adolias*, sect. 10, Feld. Neues Lep. p. 35 (1861).

*Lerias*, Boisd. Voy. Astr. Lep. p. 125 (1832); Feld. Neues Lep. p. 36 (1861).

Anterior wings subtriangular, costal margin arched and convex, apex rounded (generally more prominently so in the female); outer margin slightly waved and slightly concave beneath apex; inner margin nearly straight. First and second subcostal nervules emitted before the end of cell, the second longer than the first; third emitted some distance before the apices of first and second; fourth and fifth bifurcating at about two-thirds beyond end of cell. Lower disco-cellular nervule practically obsolete, leaving the cell open, or sometimes slender and faintly visible; first median nervule with the basal portion curved and rounded, and with an apparently common origin with the second at apex of cell. Posterior wings ovate; costal margin oblique and slightly convex; outer margin slightly waved and broadly rounded; abdominal margin nearly straight, but becoming obliquely divergent to anal angle. Neuration generally as in *Euthalia*. Body stout; palpi porrect and pointed; antennæ variable in length.

This genus is very closely allied to the following, and as Mr. Butler truly remarks, "The structural characters which separate *Symphædra* from *Adolias* † are not very considerable, and from their uncertainty seem almost to indicate a state of transition; the style of coloration, however, is quite distinct." ‡

*Symphædra* is found in Continental India, and throughout the Indo- and Austro-Malayan regions. §

#### 1. *Symphædra dirtea*. (Tab. XII., figs. 7 ♂ and 8 ♀.)

*Papilio Dirtea*, Fabricius, Ent. Syst. iii. 1, p. 59, n. 184 (1793).

*Adolias Boisduvalii*, Boisd. Sp. Gen. i. t. 8, f. 2 (1836).

*Adolias Dirtea*, Gray, Lep. Ins. Nepaul, p. 12, t. 10, f. 1, 2 (1846); Horsf. & Moore, Cat. Lep. Ins. Mus. E. I. C. i. p. 198, n. 403 (1857); Moore, Trans. Ent. Soc. ser. 2, vol. v. p. 84, n. 48 (1859).

*Lerias Dirtea*, Feld. Wien. Ent. Mon. iv. p. 400, n. 25 (1860).

*Symphædra Dirtea*, Butl. Proc. Zool. Soc. 1868, p. 613, n. 3; Cat. Fabr. Lep. p. 88, n. 3 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 540, n. 1 (1877); Druce, Proc. Zool. Soc. 1873, p. 346, n. 2; Godm. and Salv. Proc. Zool. Soc. 1878, p. 639, n. 21.

Male. Wings above very dark chocolate-brown; anterior wings with a small whitish subapical spot placed beneath the fourth subcostal nervule, and a greenish outer marginal fascia, which is almost obsolete at apical angle and gradually widens to posterior angle; the inner margin of this fascia is very waved and subdentate; posterior wings with a very broad outer bluish marginal fascia, with violaceous reflections, occupying about half of wing, and containing a submarginal series of blackish spots placed between

\* 'Malay Archipelago,' 3rd edit. p. 29.

† = *Euthalia*.

‡ Proc. Zool. Soc. 1868, p. 614.

§ Mr. Kirby (Syn. Cat. Diurn. Lep. p. 258 (1871) gives Australia as a habitat of *S. Æropus*.

the nervules and a marginal row of much larger subconical spots of the same colour placed upon and divided by the nervules; this bluish area is situated interiorly, and becomes shaded with greenish and violaceous at and near anal angle; apical portion of abdominal margin thickly clothed with long pale ochraceous hairs. Wings beneath very warm and dark ochraceous. Anterior wings with a small and very pale bluish subapical spot situate beneath the bifurcation of the fourth and fifth subcostal nervules, a cluster of irregular pale spots in cell and a long and irregularly curved one at the termination of the same, which is followed by two very indistinct spots placed one on each side of the upper discoidal nervule; two pale discal spots on each side of the second median nervule, and one beneath the third median nervule; inner margin and area of the outer angle broadly suffused with fuscous, the last with two bluish spots placed one on each side of the third median nervule; above these are a subobsolete and submarginal series of pale spots placed between the nervules. Posterior wings with two pale spots in cell, a curved discal series of six or seven pale spots placed between the nervules, and a submarginal series of small fuscous spots placed between the nervules, with their surrounding areas somewhat pale. Body and legs more or less concolorous with wings; antennæ black, their apices warm ochraceous.

Female. Wings above chocolate-brown, with the marginal fringe alternately concolorous and pale greyish, and with the following yellowish spots:—anterior wings with three spots in cell, two at its termination, followed by two placed one on each side of the upper discoidal nervule; an oblique discal series of seven spots placed between the nervules, two beneath cell, situate one on each side of second median nervule, a cluster of five irregular spots near base and between third median nervule and submedian nervule, and an outer submarginal series, placed between the nervules, increasing in size towards outer angle; a small yellowish streak on inner margin near its apex. Posterior wings with the following yellowish spots:—three beneath costal nervule, three between first and second subcostal nervules, four between lower subcostal and discoidal nervules, three in cell (the first being only a small basal streak), three beyond cell before the first median nervule, two beneath cell placed one on each side of second median nervule and two on basal half of abdominal margin; and three large spots—denoted by pale bluish margins with anterior and posterior yellowish spots—near anal angle divided by the second and third median nervules. Anterior wings beneath greenish ochraceous, darker and somewhat bluish at area of median nervules, marked generally as above, but spots larger and pale bluish grey, those in and at termination of cell fused and the cluster of spots beneath base of cell obsolete. Posterior wings beneath pale greenish, the basal half more or less suffused with ochraceous; spots as above, but much paler. Body above chocolate-brown, with the following yellowish spots:—six thoracic (two anterior, two central, and two posterior), and four at base of abdomen; a narrow lateral streak on each central side of thorax, and a small spot at extreme base of wings; body beneath and legs more or less concolorous with wings.

Exp. wings, ♂ 76 to 95 millim.; ♀ 92 to 109 millim.

HAB.—Malay Peninsula; Province Wellesley, Penang (colls. Dist. and Säuer); Malacca (Pinwill—Brit. Mus.)—Sumatra (Forbes, coll. Dist.)—Billiton (coll. Godm. & Salv.)—Banea.\*—Java (Brit. Mus.)—Borneo (coll. Godm. & Salv.); Sandakan (Pryer—coll. Dist.); Banjarmasin (coll. Dist.)

This species attains its maximum size in the Malay Peninsula; at least such is the evidence of a long series now before me. The species varies considerably in Borneo, where male specimens occur agreeing with the one here figured from Province Wellesley, while smaller ones are found which have the marginal spots to the posterior wings larger. †

\* Coll. by M. Teysmann (Pet. Nouv. Ent. vi. p. 404 (1874).

† Mr. Butler (Proc. Zool. Soc. 1868, p. 613) has described these small and dark Bornean specimens as a "local race":—"Alis minoribus obscurioribus, antennis fulvo acuminatis." Another local race from Hainan has been specifically differentiated by Mr. Moore under the name of *S. pardalis* (Proc. Zool. Soc. 1878, p. 699).

In Province Wellesley (as I have elsewhere recorded)\* old fallen fruit was an attraction to this species, and sliced pine-apple placed at the proper season in a road which these butterflies frequented was generally sure to be visited by a good supply of both males and females. †

The following species is only known by its description, and, as far as I am aware, is contained in no collection in this country. No figure exists, and therefore the description can alone be given. It represents, like *R. eudoxia* (*ante*, p. 99), a specimen from Malacca, collected during the voyage of M. A. Delessert.

### *Symphædra?* *emalea*.

*Argynnis Emalea*, Guérin, Deless. Souv. Inde. ii. p. 72 (1843).

*Symphædra Emalea*, Kirby, Syn. Cat. Diurn. Lep. p. 259, n. 10 (1871).

“Alis subrotundatis, anticis apice subconcavis, supra fulvis; anticis apice et lineis flexuosis, posticis lineis flexuosis punctisque nigris, maculis costalibus duabus albis, subtus griseo-fulvis margaritaceo-micantibus, fascia media communi-alba, maculari, extus recta, intus dentata.—Enverg.  $7\frac{1}{2}$  cent.”

“Elle a beaucoup d'affinités avec l'*Arg. Thyelia* de Fabricius (God., p. 257). Le dessus de ses quatre ailes est d'un jaune-fauve-vif, un peu plus sombre à la base. L'extrémité des premières est noire avec deux bandes ondées de noir parallèles au bord externe, et moins marquées près de l'angle inférieur; elles ont, en outre, au milieu, une bande dentelée et ondulée de noir servant de limite à la portion plus obscure de leur base. On voit dans le milieu de la cellule discoïdale une petite bande transverse et brune avec le milieu fauve. Les inférieures ont au bord externe trois lignes noirâtres flexueuses; une ligne flexueuse au milieu, se continuant avec celle des supérieures; et, entre cette ligne et les externes, une série de six points noirs dont les deux antérieurs et celui de l'angle anal un peu plus forts; elles ont à la côte deux taches blanches, de forme carrée; l'une au milieu, l'autre près de l'extrémité antérieure. Le dessous des quatre ailes est d'un gris-cendré-jaunâtre à reflets violets et perlés avec les nervures fauves; elles sont traversées au milieu et obliquement par une ligne maculaire blanc bordé de noirâtre, droite du côté externe, fortement dentée, surtout aux supérieures, du côté interne, et très-élargie à la côte des supérieures. On voit, en outre, aux ailes inférieures une série de six petits points noirs correspondant à ceux du dessus. Le corps est d'un brun jaunâtre, les antennes sont noires avec le côté antérieur fauve.

“Habite la côte Malaye.”

### Genus EUTHALIA.

*Euthalia*, Hübner, Verz. bek. Schmett. p. 41 (1816); Moore, Lep. Ceyl. i. p. 31 (1881).

*Aronthea*, Horsf. Cat. Lep. E. I. C. t. 8, f. 6 (1829); Zool. Journ. v. p. 65 (1830).

*Adolias*, Boisd. Sp. Gén. i. t. 3, f. 2 (1836); Westw. Gen. Diurn. Lep. p. 289 (1850); Feld. Neues. Lep. p. 34 (1861); Butl. Proc. Zool. Soc. 1868, p. 600.

*Itanus*, Feld. Neues. Lep. p. 34 (1861).

*Dophla*, Moore, Lep. Ceyl. i. p. 33 (1881).

\* Ent. Month. Mag. vol. xii. p. 207.

† That observant naturalist Cons. E. L. Layard, writing from New Caledonia, bears witness to the fact of rotten fruit being a very strong attraction to Lepidoptera. He writes:—“At this moment I have in my verandah a parrot, which is daily regaled with a portion of a banana. Every evening I see a dozen or more of the large *Sphingidæ* and *Noctuæ* trying to effect an entrance into the cage to get at the rotting fruit, which is generally invisible from the outside. . . . I have always found bananas the best bait to attract the night-flyers, but only when they begin to rot” (‘Nature,’ vol. xviii. p. 301).



Anterior wings triangular; costal margin arched and more or less convex; apex more or less prominent, rounded, or subacute; outer margin somewhat concave beneath apex, and uneven or slightly wavy; inner margin nearly straight. First and second subcostal nervules emitted before the end of cell, the first some distance from and the second near end of cell; third commencing either at about one-fourth or midway from end of cell, and extending to apex; fourth and fifth bifurcating at about three-fourths from end of cell, and terminating beneath the apex; upper disco-cellular short and angled; middle disco-cellular acutely recurved; lower disco-cellular nervule generally obsolete, leaving the apex of the cell open, or when present slender, oblique and slightly concave; median nervule robust; first median nervule strongly curved at base, where it has an apparently common origin with the second at apex of cell. Posterior wings subovate; costal margin oblique and slightly convex; outer margin rounded, convex, and slightly wavy (in the males of some species the anal angle is slightly acuminate or pointed). Costal nervule curved and extending to apex; precostal nervule strongly curved outwardly; first subcostal nervule emitted near base of subcostal nervule, the second some distance beyond. Cell with the apex always practically open, in some species having the appearance of being closed by a slender and indistinct lower disco-cellular nervule. Body short and robust. Palpi porrect, obtusely pointed at the apex. Antennæ long and nearly straight.

*Euthalia* is a genus which belongs to the true Oriental region. It extends northward to China, but apparently not to the north-westward of India, for though found by Mr. Hocking at Dharmasala, in the N.W. Himalaya,\* it was not collected by Major Roberts at Candahar,† nor by Major Swinhoe in Beloochistan;‡ Dr. Stoliczka failed to meet with the genus in Yarkand,§ and it was absent from the collection made by Fedchenko in Turkestan.|| It is, however, in North-Eastern India that the genus reaches its maximum in the size and beauty of its species, and this should therefore be considered its head-quarters. It is found in the Andaman Islands, Ceylon, through Burma, Tenasserim, and the Malay Peninsula, and onwards in the Malayan Archipelago, though according to present knowledge not to the eastward of Celebes and the Philippine Islands. About seventy species are at present described.

We are now acquainted with the larvæ of several species of this genus (one of which is here figured), and which are as interesting and peculiar as those of any genus in the Rhopalocera. We know, from the researches of the last few years,—researches kindled and stimulated by the teachings and influence of the late Charles Darwin,—that when we see an abnormally developed caterpillar, either in colour or structure, we may almost certainly predicate that it thereby enjoys an immunity or protection from the attacks of its natural enemies.¶ We also know that similar protection is acquired by the resemblance “mimicry” which the subject possesses

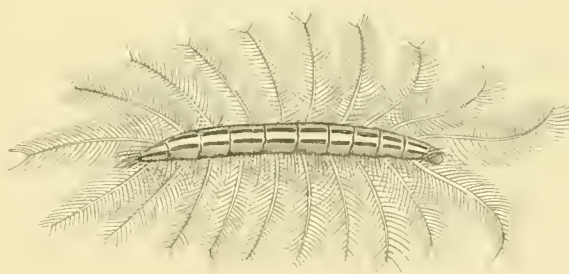


FIG. 39.—Larva of *Euthalia garuda*. From drawing by Gen. Hardwicke, in Horst. & Moore, Cat. Lep. Mus. E.I.C.

\* Recorded by F. Moore, Proc. Zool. Soc. 1882, p. 239.

† See Butler, Proc. Zool. Soc. 1880, p. 403.

‡ Ibid. 1881, p. 602.

§ ‘Scientific Results Sec. Yarkand Miss.’ by F. Moore. Calcutta, 1879.

|| ‘Mon. Lep. collect. by Fedchenko in Turkestan,’ by N. G. Erschoff. St. Petersburg, 1874.

¶ See Mr. Jenner Weir’s experiments with birds, and Mr. Butler’s with lizards (Trans. Ent. Soc. 1869, pp. 21 and 27). The results are condensed and discussed by Mr. Darwin (‘Descent of Man,’ 2nd edit. p. 326), and by Mr. Wallace (‘Natural Selection,’ p. 117 *et seq.*)

to some uneatable genus or species, and this may apply in the present case. Dr. Horsfield, who was no advocate of this theory, writing in pre-Darwinian times, and with a strong leaning to the views (Circular and Quinarian) of MacLeay, with the thoroughness that marks all his work, was struck by the appearance of these larvæ, and sought for their analogy.\* This he considered was to be found in the Myriopoda and in the genus *Scutigera*. On the lines of this theory (mimicry) such a view is extremely interesting, and acquires a reasonableness which the MacLeayan doctrine † failed to supply.

A. *Cell of posterior wings apparently closed by a subobsolete and slender nervule.*

1. **Euthalia derma.** (Tab. XIX., fig. 4 ♂.)

*Adolias Derma*, Kollar, Hüg. Kaschn. iv. 2. p. 436 (1848).

*Adolias Eva*, Feld. Reise Nov. Lep. iii. p. 432, n. 692 (1866).

*Adolias evelina*, Race *A. derma*, Butl. Proc. Zool. Soc. 1868, p. 600.

Male and Female. Wings above fuliginous-brown; cell of anterior wings crossed by two waved blackish lines at centre (between which is a prominent carmine spot), and two lines converging posteriorly at extremity; cell of posterior wings with a faint blackish oblique line near centre and two prominent black lines at apex; both wings crossed by a discal curved fuliginous fascia, commencing on anterior wings near end of cell, where it is broadest, and terminating on posterior wings near centre of abdominal margin, where it is narrowest; beyond the fascia the colour is slightly paler, the posterior wings possessing a somewhat faintly darker and very narrow submarginal fascia. Wings beneath pale greenish; cellular markings of anterior wings as above, but with the interspaces between the pairs of lines pale brownish; a sub-basal fuscous streak outwardly margined with white, and an irregular spot beneath cell near base of third median nervule; cellular markings of posterior wings as above, but with an additional curved black line beyond apex, a similar but shorter mark near and between the bases of the discoidal and lower subcostal nervules,—this is preceded by a rounded spot between the subcostal nervules and a larger and partly closed one containing a carmine spot between the upper subcostal nervule and costal nervule; there is also a small carmine spot in cell; a darker discal fascia crossing both wings as above, a similarly coloured broad submarginal fascia commencing on anterior wings at upper discoidal nervule and becoming obsolete on posterior wings at the median nervules, followed by a waved and lunulate fascia broken between the nervules; the anterior wings also possess a broad, darker oblique subapical patch, its margins and also the apical margin of posterior wings more or less infuscated.

Exp. wings, ♂ 87 to 94 millim.

HAB.—Continental India; Silhet (Brit. Mus.); Assam (Felder).—Malay Peninsula; Perak (Dr. Townsend—coll. Godm. & Salv.)—Java (Felder).—Borneo (coll. Dist.)—Celebes (coll. Dist. and Brit. Mus.)—Philippines; Luzon (Felder).

A single male specimen collected by Dr. Townsend in Perak, and which is here figured, is the only knowledge I have of the species in this fauna. It is in itself closely allied to *A. evelina*, Stoll, and has been called a local race of that species, simply, and necessarily, because Stoll's species was first described. Philosophically, however, as *A. derma* has an exceedingly wide range, it is probably the archaic form, and *A. evelina* the more or less local race.

\* Zoological Journ. v. p. 67 (1830).

† This was admirably and laboriously developed by Swainson, with (to use the words of Wallace) "an amount of knowledge and ingenuity that have rarely been surpassed." See his 'Hist. and Nat. Arrang. of Insects,' in which he was assisted by Shuckard.

B. Cell of posterior wings entirely open.

a. Third subcostal nervule of anterior wings emitted at about one-fourth or less from apex of cell.

2. *Euthalia anosia*. (Tab. XIV., fig. 5 ♀.)

*Adolias Anosia*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. i. p. 187, n. 376 (1857); Trans. Ent. Soc. ser. 2, vol. v. p. 65, n. 5, t. 5, f. 1 (1859).

Female. Wings above ashy-green. Anterior wings with the basal area from costa to a little beneath cell, and terminating a little beyond cell, very dark ashy-green; this area is outwardly bounded by a straight, oblique and connected series of four white spots outwardly angulated and pointed; these are followed by two white spots directed inwardly and separated by the second median nervule; the outer pale green area is brightest from about the centre of third median nervule to middle of abdominal margin, which pale coloration is followed posteriorly by some very dark green marks, a similarly coloured spot being found on each side of the upper discoidal nervule; outer margin dull, dark greenish; cell crossed by three dark lines bordered with very pale and bright ashy-green, the first near base curved outwardly, the second near centre straight, and the third near apex somewhat resembling the letter S; beyond cell are two black lines, the outer one much waved and sinuated; and beneath cell, between the bases of the third median nervule and submedian nervule, are some dark spots and lines bordered with very pale and bright ashy-green. Posterior wings with the outer half very much paler and with pinky suffusions, which extend and are particularly noticeable from costa to lower subcostal nervule; this paler outer area has its inner margin darker and concavely scalloped, and contains near its centre a series of small, obscure, dark spots, which are margined with pale ashy irrorations, particularly the innermost spots; the extreme base of the wings is darkest, and the cell contains two spots with pale and dark margins, the first subquadrate near centre and the second sublunate near apex; a similar spot above and near base of lower subcostal nervule, another near base of abdominal margin, and a dark spot between the bases of lower subcostal and discoidal nervules. Wings beneath very much paler and marked generally as above, the outer apical margins of anterior wings distinctly fuscous. Body and legs more or less concolorous with wings.

Exp. wings, ♀ 78 millim.

HAB.—Continental India; "North India" (Moore).—Tenasserim (Brit. Mus.)—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (coll. Gosse).

This species appears to be scarce in the Malay Peninsula, but one specimen (female) being contained in my collection. The male is smaller, somewhat darker, and wanting the white spots to the anterior wings.

3. *Euthalia garuda*.\* (Tab. XIV., fig. 1 ♂; fig. 2 ♀.)

*Adolias Garuda*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. i. p. 186, n. 374 (1857); Trans. Ent. Soc. ser. 2, vol. v. p. 64, n. 3, t. 3, f. 2 (1859); Butl. Proc. Zool. Soc. 1868, p. 603, n. 21; Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539, n. 2 (1877).

*Euthalia Garuda*, Moore, Lep. Ceyl. i. p. 32, t. 16, f. 2, 2a (1881).

\* When Mr. Moore applied this name to Indian representatives of the species, he doubtless used the word in its Hindu sense, as found in the Sattvika Purānas. Compared with this, "Garuda," as pointed out by the late Mr. J. R. Logan, is used by the Malays in a partial signification only:—"Gārūda, or Gūrda, is a monstrous bird, which Malay romancists usually evoke for the purpose of desolating a country." This is illustrated in the Malay poem 'Shair Bidasari':—

"Datanglah kapada suatu masa  
Melianglah angas deri angkasa  
Angas Garūda burung perkasa  
Menjadi negri rosā benasā."

"There came upon a certain time  
A bird flying from the heavens,  
The bird Garuda, a mighty bird,  
Destroying and desolating the land."

—('Journ. East Ind. Archipelago,' vol. i. pp. 41-2.)

Male. Wings above fuliginous-brown. Anterior wings with the basal half, excluding cell, much darker or fuscous; cell crossed by five blackish lines, one somewhat oblique near base, the other four in pairs, connected posteriorly, and situate two about centre and two at extremity; between these lines the colour is much darker; immediately beneath basal half of cell are some indistinct blackish markings; at the extremity of the basal dark coloration is a curved series of five greyish spots placed between the nervules, the upper three in somewhat oblique series beyond end of cell, divided by the discoidal nervules, the fourth and fifth curved inwardly and divided by the second median nervule; two subapical greyish spots, one on each side of the bifurcation of the fourth and fifth subcostal nervules, and a narrow, waved, dark fuscous submarginal fascia. Posterior wings with the base and a broad curved discal and outwardly dentate fascia, much darker or fuscous; cell partially crossed by two pairs of blackish lines, looped and convexly united posteriorly, situate respectively near the centre and extremity; a submarginal series of small blackish spots placed between the nervules, the extreme outer margin of both wings narrowly fuscous, with the fringe more or less greyish. Wings beneath pale brownish olivaceous, cellular markings as above, but posterior wings possessing a long ovate spot above, and a smaller spot beneath the base of the first subcostal nervule, and a curved line on outer side of base of discoidal nervule, continuous to the lower pair of dark lines crossing cell; greyish spots as above, but brighter, and an additional third subapical spot between the discoidal nervules; a narrow dark submarginal fascia to both wings, becoming faint and obsolete on posterior wings towards abdominal margin; posterior wings with the submarginal spots as above, and the outer margin of anterior wings excluding apex, and apical margin of posterior wings, very pale violaceous. Body and legs more or less concolorous with wings.

Female. Larger than the male, wings above paler, the markings as in the other sex, but the submarginal fascia to anterior wings broken and indistinct, and the whole basal half of posterior wings darker; beneath as in male, but paler, and the submarginal fasciæ more broken.

Exp. wings, ♂ 60 to 67 millim.; ♀ 76 to 80 millim.

HAB.—Continental India; Silhet, Bengal, Oudh, Sind (Brit. Mus.); Bombay (Dr. Leith—coll. Dist.)—Ceylon (coll. Moore).—Burma (Brit. Mus.)—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (coll. Godm. & Salv., and Brit. Mus.)—Java (Brit. Mus.)

This is a variable species, the greyish spots on the upper surface of the anterior wings being frequently obsolete. In all the specimens I have examined the males are darker in hue than the females.

The larva and pupa are figured by Horsfield and Moore\* from the original drawings by General Hardwicke, and the first has been reproduced here (*ante*, p. 115, fig. 39). According to the last-named observer, the larva feeds on "*Trophis aspera* and on a species of *Bryonia*." † According to Mr. A. Grote ‡ and the Rev. J. H. Hocking § it feeds upon the mango. ||

\* Cat. Lep. Mus. E. I. C. t. vi. f. 2, 2a.

† Ibid. p. 187.

‡ Ibid.

§ Proc. Zool. Soc. 1882, p. 239.

|| Another species of the genus, *E. aconthea*, is also described by Horsfield as feeding on the mango (Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 185). Of the mango in Dominica, F. A. Ober makes a curious observation:—"The mangoes are bristling with spikes of blossoms—white with them—but not a bird nor a butterfly is hovering above them, though the surrounding trees and shrubs are alive with them. This is a fact I have long noticed, that the mango is ever deserted" ('Camps in the Caribbees,' p. 21). Now we know that the mango was introduced into the West Indies, and the dramatic circumstances under which plants from Bourbon were first introduced to Jamaica have been graphically described by Sir Joseph Hooker (Lect. to Roy. Instit. on the 'Distr. of the North Am. Flora,' 1878). But in the East the mango is not deserted by birds and butterflies, for not only do the *Euthaliads* frequent them to deposit the eggs which produce the devouring larvæ, but also—to quote no other author than the pleasant and versatile Phil. Robinson—there is the "green parrot" that settles "with a screech among your mangoes," and the "watcher," who has "all day long to sit and watch the ripening fruit, to wage a perpetual war with little beasts and little birds, every squirrel a throe, and each finch a spasm" ('In my Indian Garden,' pp. 21 and 181).

4. *Euthalia jama*. (Tab. XIV., fig. 8 ♂; Tab. XV., fig. 4 ♀.)

*Adolias Jama*, Felder, Reise Nov. Lep. iii. p. 431, n. 690 (1866); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539, n. 3 (1877).

*Euthalia Alpheda*, var. *A. Jaina*, Kirby, Syn. Cat. Diurn. Lep. p. 254, n. 27 (1871).

Male. Wings above fuliginous-brown. Anterior wings with a black line crossing cell near base and apparently continued between the median and submedian nervures, a dark brown spot crossing centre of cell, the margins of which are black, and which is rounded and closed posteriorly; a somewhat similar spot at end of cell; two similarly margined spots obliquely, but not quite, crossing cell of posterior wings; a dark brown oblique fascia crossing disk, commencing near termination of cell (where there is an indistinct bronzy area), and terminating on inner margin, about one third from base; this is followed by a somewhat narrower oblique fascia crossing both wings, commencing near apex of anterior wings and terminating on posterior wings near the abdominal margin at about one-third from anal angle: this fascia is widened at inner margin of anterior wings; posterior wings with a much-waved, narrow, dark submarginal fascia, and outer margins of both wings distinctly darker. Wings beneath pale greenish ochraceous: cellular markings as above; anterior wings with a rounded spot beneath cell on inner side of third median nervule and a smaller dark spot on outer side of that nervule; posterior wings with a looped spot beneath and near the base of costal nervule, followed by a smaller rounded spot beneath the first subcostal nervule, and a curved black line beneath the base of second subcostal nervule; fasciæ above very indistinctly and narrowly seen beneath. Body and legs more or less concolorous with wings.

Female. Pale brownish; cellular markings as in male; anterior wings with a broad pale fascia, occupying a space equivalent to that between the extreme margins of the two discal pale fasciæ in male;—this fascia is pale, obscure, bluish above the second median nervule, and pale brownish beneath that nervule, and its outer margin is brown and prominently waved and angulated: at costa it possesses an irregularly shaped central, and a somewhat similar outer subolivaceous spot, the last almost continued to apex above the fourth subcostal nervule; posterior wings with fasciæ as in male, but which are paler and narrower. Wings beneath as above but paler; markings similar, but more indistinct; posterior wings with the outer-cellular markings as in male.

Exp. wings, ♂ 68 millim.; ♀ 71 millim.

HAB.—Continental India; Assam (Felder).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Castelnau and Pinwill—Brit. Mus.; Biggs—coll. Gosse).—Banca (Felder).

This is but a local race of the Javan *E. alpheda*, Godt.,\* and differs principally in the female sex. Mr. Butler, from an examination of Capt. Pinwill's collection, remarked that in Malacca the "species appears to be common,"† but in Province Wellesley—judging from collections—it appears to be a scarce insect.

5. *Euthalia laverna*. (Tab. XIV., fig. 7 ♂.)

*Adolias laverna*, Butler (part,—♀ only),‡ Cist. Ent. i. p. 29 (1870); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539, n. 4 (1877).

\* Even its describer somewhat unusually remarked, "Localform der javanischen *A. alpheda*, Godt." (Reise Nov. Lep. p. 431).

† Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539 (1877).

‡ Some confusion is likely to arise from a consultation of the original description of this species. Mr. Butler (Cist. Ent. i. p. 29, 1870) described a male specimen from Borneo and a female specimen from Penang under the above name, and afterwards figured the first in his 'Lepid. Exot.' (t. ix., f. 5). On subsequently receiving both sexes from Malacca, he wrote (Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539), "I find that the male from Borneo figured in my 'Lepidoptera Exotica' is a distinct species," thus electing to make the Penang female the type, of which the only description is—"♀. Omnino velut in *Tanœcia Pulasara* coloratæ."

Male. Wings above fuliginous-brown. Anterior wings with the inner margin and a broad central transverse fascia, which is outwardly dentate and anteriorly bifurcate from median nervure to near costa, dark brown: before and a little after the upper portion of this fascia the colour is paler than the remaining outer portion of wing, which contains a submarginal waved and broken black line not reaching posterior angle, where there is a dark brown patch; there are also two basal black lines. Posterior wings with the cell crossed by four black lines and a submarginal series of narrow linear black spots placed between the nervules. Wings beneath pale greenish, suffused with ochraceous; anterior wings with the cell crossed by some black lines and a similar waved and broken line near its apex; two spots beneath cell divided by the third median nervule: a waved submarginal narrow black fascia starting from a subapical fuscous patch, which contains two whitish spots, and is inwardly margined by the same colour; posterior wings paler; cell crossed by a looped line near its centre and a curved line near its apex—above the last is a short line beneath the base of lower subcostal nervule, a bent line above that nervule, and a looped line beneath the base of costal nervule; two discal narrow waved ochraceous fasciæ, the outer one most distinct, from which to outer margin the colour is darker. Body and legs more or less concolorous with wings.

Female. Wings above pale brownish. Anterior wings with the cell crossed by four blackish lines, and with a curved line near apex; beneath the cell are two spots divided by the third median nervule,



FIG. 10. *Euthalia laverna*, ♀.

the inner one largest; a transverse series of contiguous, linear greyish spots only divided by the nervules, their inner apices conical and outwardly margined with a waved and sinuated narrow dark brown fascia; the two upper spots divided by the upper discoidal nervule are longest, and are preceded by a small whitish subcostal spot, the third spot is shorter than the fourth and fifth, and the lower one beneath the third median nervule is short and notched internally; all these spots are more or less suffused with pale brownish, and the first, fourth and fifth possess an inner brown looped line. Posterior wings with two pairs of looped lines crossing cell, the transverse series of large greyish spots as on anterior wings, but not extending to

abdominal margin, and with their outer margins defined by a more angulated and inwardly dentate narrow fascia, which is again outwardly margined with greyish, thus dividing the outer dark margin into inwardly angulated spots. Wings beneath with the basal halves pale ochraceous; cell of anterior wings marked as above; cell of posterior wing with the looped lines and adjacent markings as in corresponding wing of male: the transverse series of spots more fused than above, the greyish colour extending to outer margin.

Exp. wings, ♂ 50 millim.; ♀ 60 millim.

HAB.—Malay Peninsula; Penang; Malacca (Brit. Mus.)

This species I only know by the specimens contained in the British Museum, the sexes of which are here figured and described. The female, as Mr. Butler has remarked, bears a striking resemblance to a species of the next genus,—*Tanaëcia pulasara* (Tab. XIV., fig. 13),—which is also found in this fauna.

#### 6. *Euthalia adonia*, var. (Tab. XIX., fig. 10 ♂; fig. 11 ♀.)

*Papilio Adonia*, Cramer. Pap. Ex. iii. t. 255, C, D (1782).

*Nymphalis Adonia*, Godt. Enc. Méth. ix. p. 400, n. 173 (1819).

*Aconthea Lubentina*, Horsf. (nec Cram.) Cat. Lep. E. I. C. t. 5, f. 5. 5a (1829).

*Adolias Adonia*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 188, n. 378 (1857); Snellen. Tijds. Ent. xix. p. 119, n. 28 (1876); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539, n. 1 (1877).

Male. Wings above dark olivaceous. Anterior wings with the basal portion of cell and posterior outer margin greenish; cell crossed near centre by two black lines, between which the colour is reddish; these lines are followed by a narrow transverse white fascia, which is outwardly concave, beyond which are two other black lines, with a reddish spot between them; three white spots beyond cell divided by the nervules, and a waved discal series of five white spots placed between the nervules, the lowest between the first and second median nervules; these are followed by two larger but obscure spots divided by the third median nervule; an obscure, broken, fuscous submarginal line. Posterior wings with the cell crossed by two fuscous lines and with a broad greenish marginal border; this greenish area contains a central series of six blackish spots placed between the nervules, with an elongate linear spot at anal angle; there are also three bright red spots near outer margin at apex and two of the same colour on inner side of the green area, situate one on each side of the lower subcostal nervule,—these are outwardly and inwardly margined with blackish and are followed by two blackish lines which do not pass third median nervule. Wings beneath pale olivaceous-brown; anterior wings with the cell crossed as above, but with a short basal black line and the red enclosure brighter and larger, the green shadings on upper surface absent; posterior wings with costa narrowly red, with the anal margin greenish, and with the two blackish lines crossing cell enclosing two red spots; at apex of cell and on each side of lower subcostal nervule are two similar black lines enclosing red spots, the first named preceded by a small black spot; a discal series of four red spots placed between the nervules, the lower one beneath the discoidal nervule; the submarginal series of black spots as above, but smaller, the upper three with an attached outer red spot, and the linear spot at anal angle broken into two. Body and legs more or less concolorous with wings.

Female. Larger than male. Anterior wings above olivaceous-brown, marked generally as in male, but with all the white spots very much larger, the waved discal series consisting of nine spots, of which the lower five are very large, irregularly rectangular and sinuously following the three placed beyond cell; a pale and obscure greenish submarginal streak at posterior angle. Posterior wings olivaceous-brown, with a wide macular, central white fascia divided by the nervules, outwardly margined with blackish and inwardly margined with the same colour as far as end of cell, which is crossed by two black lines; outer margin broadly greenish from about discoidal nervule to anal angle; a submarginal series of seven blackish spots placed between the nervules, the upper three and the seventh attached to an outer red spot. Wings beneath as above, but paler in hue; anterior wings with the cell marked with red as in male, the submarginal fuscous fascia more distinct than above, and with a large white submarginal streak at posterior angle; posterior wings as above, but paler, the costal margin narrowly red, cellular black lines enclosing a red spot, a similarly enclosed red spot at end of cell, and the same above and near base of upper subcostal nervule; submarginal spots smaller, the upper three only attached to outer red spots; abdominal margin pale greenish.

Exp. wings, ♂ 58 millim.; ♀ 70 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.)—Java (Brit. Mus.); Batavia (Snellen).

The figures represent two Malaccan specimens, which were collected by Capt. Pinwill and are now contained in the British Museum. The male differs from Javan and typical forms of the species by the darker coloration above and the fewer red spots to the posterior wings; the absence of the red spot at anal angle being particularly noticeable; the colour beneath is also paler, and the red spots to posterior wings fewer and paler. The female also differs in several particulars. It is thus probable that a distinct race of *E. adonia* is found in the Malay Peninsula.

7. *Euthalia decorata*. (Tab. XIV., fig. 9 ♂.)

*Adolias decoratus*, Butler, Proc. Zool. Soc. 1868, p. 605, n. 39, t. xlv. f. 2 & 9.

Male. Wings above fuliginous-brown. Anterior wings with the cell crossed by four dark fuscous lines, two near base and two about apex, and one beyond extremity, waved and convex; beneath the median nervure is a looped line on each side of the base of third median nervule, and a short line a little distance from base of submedian nervure; a broad submarginal greyish fascia, more or less suffused with bronzy-green, the margins of which are convexly dentate inwardly and concavely dentate outwardly, where it is also distinctly margined with fuscous. Posterior wings with the outer half greyish, shaded with bronzy-green from about discoidal nervule to anal angle, and containing a central much-waved and inwardly dentate narrow fuscous fascia; cell crossed by a dark line near base and a double looped line near apex; a small spot near bases of second and third median nervules. Wings beneath ochraceous; anterior



Fig. 41. *Euthalia decorata*. ♀.

Exp. wings, ♂ 54 to 56 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Singapore (coll. Roberts).

The males of this species vary in hue; specimens from Province Wellesley, of which one is here figured, being paler than the Singapore type as delineated by Mr. Butler; the greyish fascia to the anterior wings of the former also appears to be slightly broader than that as portrayed in the latter.

8. *Euthalia ramada*. (Tab. XIX., fig. 5 ♂.)

*Adolias Ramada*, Moore, Trans. Ent. Soc. ser. 2, vol. v. p. 69, n. 12, t. 4, f. 5 (1859); Butl. Proc. Zool. Soc. 1868, p. 605, n. 37.

Male. Wings above dark fuliginous-brown. Anterior wings with the cell crossed by five dark lines, situate two wide apart near base, two closer together about centre, and one at extremity; beneath the cell are some obscure dark looped lines, situate one before the third median nervule and two between that nervule and the submedian nervure; a submarginal obscure greenish fascia becoming broad towards posterior angle, and containing a central dark brown and much-waved line. Posterior wings with a very broad blue marginal fascia, which loses its bright hue above the lower subcostal nervule, and is intersected a little above its middle by a much-waved dark brown line; basal area suffused with some scattered bronzy-green scales. Wings beneath warm ochraceous; anterior wings with the cellular and following markings as above: posterior wings with the cell crossed by two blackish lines near base

wings marked as above; posterior wings marked as above, but with the following additional blackish lines:—a large looped line above and a smaller looped line beneath the base of the first subcostal nervule, and a curved line near base of discoidal nervule. Body and legs more or less concolorous with wings.

Female. I have not seen this specimen, but reproduce Mr. Butler's figure and description:—

“♀. Alæ multo majores, supra fusca, fascia multo latiore albicante et in posticis intus magis irregulari; subtus fascia velut supra viridi, opalescente fusco marginata; area basali flava, characteribus nigro-fuscis; margine externo omnino ad fasciam albido opalescente; corpus supra fuscum, subtus album.”



and two near extremity, which are continued and joined above the discoidal nervule; an angulated line between the bases of the second and third median nervules; an ovate spot between the bases of the lower and upper subcostal nervules, preceded by a larger one situate beneath the costal nervule; both wings crossed by two submarginal waved fuscous lines, the outer one very dark on anterior wings, the apical angle of which is suffused with greenish. Body and legs more or less concolorous with wings.

Exp. wings, 48 millim.

HAB.—Malay Peninsula; Perak (Dr. Townsend—coll. Godm. & Salv.); Malacca (coll. Hewits. and coll. Roberts).

The female of this species is either unknown or unrecognised at present. The male here figured is the specimen collected in Perak by Dr. Townsend, and now in the collection of Messrs. Godman and Salvin, to whom I am much indebted for the facilities afforded me for examination and study.

b. *Third subcostal nervule of anterior wings emitted about midway between end of cell and apex of wing.*

9. *Euthalia macnairi*,\* n. sp. (Tab. XIV., fig. 6 ♂, 10 ♀.)

Male. Wings above very dark chocolate-brown, the outer margins of both wings pale bluish; on anterior wings this bluish margin is narrow, commencing a little beneath apical angle, and slightly widening and terminating at posterior angle; on posterior wings it is very broad, especially near anal angle; outer margins narrowly black, the fringe pearly white; cell of anterior wings crossed by four blackish lines, the innermost two nearly straight, the outer two prominently bent and sinuated, and a similarly bent black line at end of cell: the three innermost of these lines are continued beneath the median nervule. Wings beneath pale olivaceous-brown; anterior wings with the basal area palest, cellular markings as above, but more distinct, and two discal, narrow, undulating fuscous fasciæ, the inner one waved, the outer entire, but somewhat discontinuous. Posterior wings with the cell crossed by some indistinct fuscous lines, a similar convex one near its apex, and an elongate ovate spot on each side of the base of the upper subcostal nervule; two discal and parallel narrow fuscous fasciæ, terminating at about the third median nervule, the inner one broadest, and the outer narrow and somewhat broken. Body and legs more or less concolorous with wings.

Female. Larger and paler in hue than the male; markings similar, but anterior wings above exhibiting the discal fasciæ only seen on the under surface of the male; these fasciæ are also slightly broader and the colour between them somewhat paler; cell of posterior wings exhibiting the transverse dark lines as beneath. Wings beneath brighter and warmer in hue than in the other sex: the markings similar.

Exp. wings, ♂ 55 millim.; ♀ 70 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.).

This and the following species represent a section of the genus in which the males are strikingly similar to each other and equally dissimilar from the females. Felder appears to have been first in recognising the sexual connection between these diverse forms, when he described † the male of *E. puseda*.

The great interest attaching to this species is that it represents the closest alliance and resemblance between the sexes of this section, the following species here described and figured showing a gradually increasing tendency to sexually differentiate; whilst it is to the Indo-Malayan region that this portion of the genus is almost confined.

\* Named after Major Fred. M'Nair, author of 'Perak and the Malays.'

† Wien. Ent. Mon. iii. p. 400, n. 23 (1860).

These all appear to be rare insects in collections received from the Malay Peninsula, but this is probably more apparent than real; for from their somewhat general similarity an unentomological collector would often consider them on the wing as but one species, and neglect them accordingly.

10. *Euthalia stoliczkana*,\* n. sp. (Tab. XIV., fig. 11 ♀.)

Male. Closely resembling the male *E. macnairi*, but larger, and with the bluish marginal fasciæ on both wings above a little broader; beneath with the narrow fuscous outer discal fasciæ to both wings much more waved and sinuated.

Female. Wings above closely resembling the female *E. macnairi*, but differing above by the absence of the bluish marginal fasciæ, which are only slightly indicated near posterior angle of the anterior wings, and appear on posterior wings as a narrow discal fasciæ, which becomes obsolete towards abdominal margin; on these wings the narrow fuscous discal fasciæ of the anterior wings are also continued, the innermost distinct, the outer one not distinctly passing first median nervule. Wings beneath warmer in hue than in *E. macnairi*, and distinctly differentiated from that species by the waved and sinuated outer discal fasciæ to both wings.

Exp. wings, ♂ 62 millim.; ♀ 70 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.)

11. *Euthalia maclayi*,† n. sp. (Tab. XIV., fig. 12 ♀.)

Male. Wings above almost identical with those of male *E. macnairi*; beneath with the outer discal fasciæ waved and sinuated as in *E. stoliczkana*, but on posterior wings the outer fasciæ is farther removed from the margin than in that species.

Female. Wings above closely resembling those of female *E. macnairi*, but the bluish marginal fasciæ to posterior wings inwardly strongly waved and hollowed at the subcostal and discoidal nervules.‡ Beneath the wings have the outer discal fasciæ strongly waved and sinuated as in *E. stoliczkana*, but on anterior wings these fasciæ are wider apart than in that species, and on the posterior wings the outer fasciæ is farther removed from the margin.

Exp. wings, ♂ (one spec.) 61 millim.; ♀ 73 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.)

*E. macnairi*, *E. stoliczkana*, and *E. maclayi* have so strong a superficial resemblance as to give the impression that they are but varieties of one species, and this was my first conclusion. The reasons which have impelled me to take the opposite view are that both sexes can be differentiated, and that the forms are not intermediate. Thus, though *E. maclayi* resembles

\* This species is dedicated to the late Dr. Ferdinand Stoliczka, the accomplished and versatile naturalist, who died a few years since whilst accompanying the Second Yarkand Mission. He visited the Straits Settlements, and his enthusiasm there in the cause of Zoology and scientific industry is shown by the following papers, viz. :—

*Aves*.—"A Contribution to Malayan Ornithology," Journ. Asiat. Soc. Bengl. vol. xxxix. part 2, p. 277 (1870).

*Reptilia*.—"Observations on some Indian and Malayan Amphibia and Reptilia," *ibid.* pp. 134, 159.

*Mollusca*.—"On the Land Shells of Penang Island, with Descriptions of the Animals and Anatomical Notes," *ibid.* vol. xli. part 2, p. 261 (1872), and vol. xlii. part 2, p. 11 (1873).

† In agreement with the principle I have pursued in this work, of using for specific purposes the names of those who have worked or are working at the biology, ethnology, or natural features of the Malay Peninsula, I have here used the name of the celebrated Russian ethnologist and traveller Dr. Mikluho-Maclay, who a few years since made an ethnological excursion in Johore.

‡ This is not shown in the figure, owing to the specimen it represents being the first received, and unfortunately in a rubbed and poor condition.

*E. macnairi* above, it partakes of the character of *E. stoliczkana* beneath, but is yet quite distinctly differentiated from that species by the pattern of those markings. Though I have followed this course I consider the conclusion but tentative. Some decision must be taken in a work like this, and the proof will ultimately rest with the local breeder of these insects. In the absence of this information analytic and synthetic empiricism are both to be deplored.

## 12. *Euthalia cocytina*. (Tab. XVIII., fig. 7 ♀.)

*Aconthea Cocytina*, Horsfield, Zool. Journ. v. p. 67, t. 4, f. 3, 3a (1829).

*Adolias Godartii*, Gray, Lep. Ins. Nep. p. 14, t. 12, f. 2 (1846).

*Adolias cocytina*, Butl. Ann. Nat. Hist. ser. 4, vol. i. p. 99 (1868).

Male. Wings above resembling the last species, but the bluish marginal bands wide, as in *E. stoliczkana*. Wings beneath pale but warm ochraceous, the markings generally as in *E. macnairi*, but paler and ochraceous; the black cellular markings of anterior wings as in preceding species.

Female. Wings above pale fuliginous-brown, cellular and infra-cellular markings as in *E. maclayi*: an oblique discal series of six elongate greyish spots, outwardly and obscurely margined with small dark spots placed between the nervules; of the former the two uppermost, divided by the first discoidal nervule, are largest, and the first is broken at its centre; the third is smallest, and the sixth, situate beneath the third median nervule, is rather faint and outwardly notched; a broad pale marginal border, becoming obsolete at apex and shaded with bluish at posterior angle. Posterior wings with the apical half broadly bluish; this area is marked with two series of whitish spots, the first and most distinct at its inner margin, which is preceded by a series of obscure dark spots, the second, which is almost obsolete near its centre; outer margin brownish; the fringe of both wings greyish white. Wings beneath pale obscure ochraceous; anterior wings marked as above, the discal series of pale spots large, more continuous, and more obscure and outwardly margined by a narrow waved fuscous fascia; posterior wings with the apical half (which has a narrow transverse dark ochraceous fascia near its anterior margin) somewhat paler. Body and legs more or less concolorous with wings.

Exp. wings, ♂ 60 millim.; ♀ 70 millim.

HAB.—Malay Peninsula; Singapore (coll. Moore)—Sumatra (Brit. Mus. and coll. Dist.)

I am indebted to Mr. Moore for the loan of the female Singapore specimen here figured, and which constitutes my sole authority for the inclusion of the species in this fauna. Mr. Butler, who first described the female,\* subsequently † added, as a synonym, the *A. mitra*, Feld. ‡ This is probably a correct course, and the reason why I have not followed it here is that the Felderian description better agrees with another Sumatran specimen in my collection, which, however, may be but a varietal form.

## 13. *Euthalia puseda*. (Tab. XVIII., fig. 8 ♀, and var. Tab. XV., f. 3 ♀.)

*Adolias Puseda*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. i. p. 191, n. 383 (1857); Trans. Ent. Soc. ser. 2, vol. v. p. 71, n. 18, t. 6, f. 5 (1859); Feld. Wien. Ent. Mon. iii. p. 400, n. 23 (1860).

*Adolias monina*, Butl. (Fabr.?) Proc. Zool. Soc. 1868, p. 608, n. 53, t. 45, f. 4; Cat. Fabr. Lep. p. 89, n. 3 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539, n. 6 (1877).

*Adolias Ludekingii*, Butl. (nec. Voll.) Trans. Linn. Soc. ser. ii. Zool. vol. i. p. 539, n. 7 (1877).

\* Ann. & Mag. Nat. Hist. ser. 4, vol. i. p. 99 (1868).

† Proc. Zool. Soc. 1868, p. 608, n. 51.

‡ Reise Nov. Lep. iii. p. 433, n. 695.

Male. Very closely resembling the corresponding sex of *E. macnairi*, the upper surface being indistinguishable; the anterior wings beneath have a distinct subapical pale fuscous patch, and the two narrow discal fasciæ are placed wider apart, the interior one being almost obsolete and the outer one waved; both wings beneath are also somewhat paler in hue.

Female. Wings above pale fuliginous. Anterior wings with the cell crossed by the following dark fuscous lines:—one near base, two near centre with their bases connected, and two at termination, the inner of which is strongly curved and the outer deeply sinuate, both narrowly connected at base; immediately beneath cell are a short line near outer base of third median nervule, a looped line forming an irregular spot at inner base of the same nervule, and a short line near base of the submedian nervule; a submarginal series of large greyish obconical spots separated by the nervules, which occupy about outer half of wing, crossed by a much-waved and dentate narrow brown fascia; the two uppermost of these spots have their centres excavated and suffused with the fuliginous ground colour, and they are all conically pointed inwardly, excepting the lowermost, situate above the submedian nervule, which is concavely excavated. Posterior wings with the outer half (excluding margin) more or less irrorated with pale greyish, its inner margin defined by a narrow waved brown fascia, and crossed by a regularly curved but inwardly dentate narrow brown fascia, the cell crossed by some obscure dark lines. Wings beneath pale ochraceous; anterior wings with the cellular lines as above, the large obconical spots extending to margin and marked as above; lower wings as above, but much paler. Body and legs more or less concolorous with wings.

Exp. wings, ♂ 52 millim.; ♀ 63 to 74 millim.

HAB.—Malay Peninsula; Penang (coll. Moore and Brit. Mus.); Malacca (Pinwill—Brit. Mus. and Biggs—coll. Gosse); Singapore (colls. Moore and Dist.)

The typical female specimen (Tab. XVIII., f. 8) is from Penang, and contained in the collection of Mr. Moore, whilst the variety (Tab. XV., f. 3) is from Malacca, and in the possession of Mr. Gosse, to both those gentlemen my thanks being due for the loan of the same.

The females are very variable, and I have seen all the intermediate forms between the two specimens here figured. The *A. ludekingii*, Voll.,\* may also be but a variety of this species, but in its typical form, as figured by Vollenhoven, certainly does not appear to be found in the Malay Peninsula.

Mr. Butler† identified the male of this species as the *Papilio monina*, Fabr.‡ I have not followed him in this course for several reasons:—Firstly, the Fabrician type is not contained in the Banksian collection, and therefore the identification is unverifiable; secondly, the males of a number of allied species are so similar that it seems impossible, from the description of Fabricius alone, to decide upon one more than another; and thirdly, as Mr. Moore has figured his species (female specimen) it seems unnecessary to sink the same without more conclusive reason.

\* Tijds. Ent. v. p. 189, t. 10, f. 3 (1860).

† Proc. Zool. Soc. 1868, p. 608, n. 53.

‡ As a synonym of this species Mr. Butler (Cat. Fabr. Lep. p. 89) has placed the *P. coccyta*, Fabr., stating that it is "figured by Jones in his unpublished 'Icones.'" The well-known American lepidopterist Mr. W. H. Edwards has, however, strongly argued (Canad. Entom. vol. xiv. p. 54) on the "utterly worthless character of the Jones drawings for identification of species." Fabricius frequently described from these drawings without any knowledge of the locality from whence the originals came.

14. *Euthalia asoka*. (Tab. XV., fig. 5 ♂; Tab. XIV., fig. 3 ♀.)

*Adolias Asoka*, Felder, Reise Nov. Lep. iii. p. 433, n. 694, t. 58, f. 1 (1866); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 539, n. 5 (1877).

Male. Wings above dark castaneous; both wings with a bluish outer marginal border, narrowest on anterior wings, where it commences a little beneath apex, widening to posterior angle, and very wide on posterior wings, terminating near submedian nervure; this bluish area is more or less suffused with purplish reflections; cell of anterior wings crossed by four black lines, two central and two terminal. Wings beneath dull and dark ochraceous; anterior wings with the cellular markings as above, followed by a curved black line connecting the lower discoidal nervule with the base of the second median nervule, and with a very narrow, waved, dark fuscous discal or submarginal fascia, commencing near lower subcostal nervule, between which and upper discoidal nervule it is strongly angulated; beyond this fascia the colour is violaceous; posterior wings with a paler waved submarginal fascia, and a very indistinct discal one which is principally visible near the subcostal nervules. Body and legs more or less concolorous with wings.

Female. Wings above pale brownish. Anterior wings with the cellular markings as in the male; a waved line beyond cell, a small looped line beneath cell at outer base of third median nervule, and a larger one of the same character at inner base of the same nervule, preceded by another small one near base; a discal series of seven pale spots divided by the nervules (the lower two together situate between the third median nervule and submedian nervure), the two upper spots divided by the upper discoidal nervule are largest, and the first is deeply scooped and excavated at its anterior margin, the third is small and subquadrate, the fourth and fifth convex interiorly; beyond these spots the colour is bluish, followed by a waved and narrow brownish fascia outwardly and broadly margined with bluish grey; a marginal fuscous line and the fringe grey. Posterior wings with a discal curved series of pale spots surrounded by darker brown, placed between the nervules, from which to the outer margin the colour is paler and contains a central narrow waved dark brownish fascia; a marginal fuscous line and the fringe grey; cell crossed by two pairs of looped lines. Wings beneath much paler and ochraceous; markings as above, but the discal series of large spots to anterior wings much paler, and not outwardly followed by bluish, and the narrow dark fascia placed much closer to them than on upper side. Body and legs more or less concolorous with wings.

Exp. wings, ♂ 60 millim.; ♀ 67 millim.

HAB.—Malay Peninsula; Penang (colls. Moore and Gosse); Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.)—Borneo (Felder).

The figure of the male here given is taken from a Malaccan specimen in the British Museum, which was collected by Capt. Pinwill. The female is in my own collection from Province Wellesley, and somewhat differs from Felder's figure\* of the same sex by the much less pale coloration of the posterior wings between the discal series of spots and the outer margin. Felder, however, refers the species to two localities, viz. "Malacca, interior" (collected by the Com. de Castelnau), and Borneo, but does not specify from which the specimen figured was received. Consequently it is at least possible that the pale form may have been from Borneo, and the species as found in the Malay Peninsula is of a somewhat melanic race.

\* Reise Nov. Lep. iii. t. 58, f. 1.

The following species is included here with some doubt. A male specimen, which is figured, and *considered* as collected in the Malay Peninsula, is the only authority I have for its presence in this fauna. Further and corroborative information is therefore desiderated.

**Euthalia lubentina.** (Tab. XIV., fig. 4 ♂.)

*Papilio Lubentina*, Cramer, Pap. Ex. ii. t. 155, C, D (1779); Don. Ins. China, t. 36, f. 3 (1799); Fabr. Sp.

Ins. p. 91, n. 403 (1781); Mant. Ins. p. 49, n. 486 (1787); Ent. Syst. iii. p. 121, n. 370 (1793).

*Nymphalis Lubentina*, Godt. Enc. Méth. ix. p. 400, n. 172 (1823).

*Euthalia Lubentina*, Hübn. Verz. bek. Schmett. p. 41 (1816); Moore, Lep. Ceyl. vol. i. p. 31, t. 16, f. 1a, b (1881).

*Adolias Lubentina*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 188, n. 379 (1857); Butl. Cat. Fabr. Lep. p. 88, n. 1 (1869).

Male. Closely resembling the male *E. adonia* (Tab. XIX., f. 10), but differing in the form of the wings, which are broader, less angularly attenuated, and the anal angle of the posterior wings not elongately produced, as in that species; on the upper surface the white spot in the cell is absent or only faintly indicated; beneath the markings are very similar.

Female. Above with the anterior wings closely resembling those of female *E. adonia* (Tab. XIX., f. 11); posterior wings, however, without the broad central white fascia of that species, and resembling those of its own male. Beneath the anterior wings are as above, the posterior wings as in male.

Exp. wings, ♂ 71 millim.; ♀ 62 to 75 millim.

HAB.—Continental India; Bengal (Moore); near Cachar (coll. Dist.); Bombay (Leith—coll. Dist.)—Ceylon (coll. Moore and Brit. Mus.)—Malay Peninsula?

The larva and pupa of this species, from drawings made by Mr. A. Grote, are figured by Horsfield and Moore,\* and from drawings of the Bros. de Alwis in Moore's Lepidoptera of Ceylon. According to Mr. Grote the larva feeds upon "Loranthus." †

Genus TANAËCIA.

*Tanaëcia*, Butler, Proc. Zool. Soc. 1868, p. 610.

In general form and neuration this genus resembles *Euthalia*, differing chiefly in the following characters:—the middle disco-cellular nervule of the anterior wing is only moderately recurved; the first subcostal nervule of the posterior wings is emitted at a greater distance from the base of the subcostal nervule than in *Euthalia*, and the second subcostal has its origin a little beyond. The palpi have a slender bristle-like terminal joint varying in different species.

This genus is much smaller in extent than *Euthalia*, and likewise has a different distribution, for whereas that genus may be said to possess its head-quarters in North-Eastern India, *Tanaëcia* is almost confined to the Indo-Malayan region, and is apparently absent from Continental India and Ceylon, though found in the Andaman Islands.

It is extremely difficult in this genus—particularly in that portion of it which is found in the Malay Peninsula—to decide in several cases, and from cabinet specimens or figures alone, whether the term "species" or "variety" should be more correctly used. I have therefore, in some cases, kept the distinct forms in specific isolation, leaving the ultimate decision to the

\* Cat. Lep. Mus. E. I. C. i. t. 12, f. 14, 14a.

† Ibid. p. 189.

local entomologist who can by breeding alone decide.\* I am unacquainted with any description or figure of the larval characters of *Tanaëcia*, though it is more than probable, from the close connection of the genera, that they partake of the unique structure of the *Euthaliad* larvæ.

As several of the species here enumerated are only known to me by figures and descriptions, it is impossible to divide the genus sectionally by neural characters.

1. *Tanaëcia flora*. (Tab. XVIII., fig. 6 ♀.)

*Tanaëcia Flora*, Butler, Proc. Zool. Soc. 1873, p. 235; Aid. Identif. Ins. t. 21 (1881).

Wings above pale fuliginous-brown; cell of each wing crossed by the usual dark linear markings. Anterior wings crossed by two obscure and irregular dark fuscous macular fasciæ, the first commencing a little beyond cell, obliquely directed outwardly to about first median nervule, from whence it is directed inwardly and becomes obsolete at about the third median nervule, the second being straight and submarginal; between the fasciæ, at area of the discoidal nervules, are some very obscure violaceous spots; outer margin narrowly pale violaceous, narrowest at apex and slightly widening to posterior angle; extreme outer border fuliginous, with the fringe grey. Posterior wings with a very broad pale violaceous margin, widening towards anal angle, with its inner margin dentate, where there are indications of a dark macular fascia. Wings beneath dark ochraceous, the markings very closely resembling those of *Euthalia macnairi* (Tab. XIV., f. 10), but paler and with the outer narrow discal fascia to anterior wings less angulated and waved.

Exp. wings, 65 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Butl.)

This unique species possesses three distinct and interesting features:—firstly, the palpi have a much shorter slender termination than other species of the genus, thus being somewhat intermediate in that respect between *Euthalia* and *Tanaëcia*, though the position of the first subcostal nervule of the posterior wings clearly denotes its relation to the last-named genus; secondly, it very closely resembles the female of *Euthalia macnairi*, a resemblance which may or may not find its subsequent explanation by the theory of “mimicry”; † and thirdly, it is a species of extreme rarity.

The female specimen here figured was taken by myself at Province Wellesley in 1868, and is now in the collection of Mr. Butler, who founded the genus, and to whom it was my great pleasure to present it. Since then, although large collections have been formed in the same neighbourhood, and continued during a term of years, not another specimen has yet been discovered, and the male still remains unknown.

\* In these empirical questions one's memory recalls the opinion of Goethe, that species only exist in the copy-books of the specialists; and the remark of the late Edward Forbes, that some can see difference and no resemblance, others resemblance and no difference, whilst some again can see neither one nor the other.

† Since I published some remarks (*ante*, p. 33) expressive of the opinion that a reference of such resemblances to the theory of “mimicry,” without the necessary support of observed facts, was more calculated to obscure than advance philosophical Entomology, much ink has been spilled by my friend Mr. Meldola and myself—*pro et con*—upon the subject. No fresh facts were available or could be advanced, and the curious are referred to the articles as they appeared (Ann. and Mag. Nat. Hist. ser. 5, vol. x. p. 417, and vol. xi. p. 43).

2. *Tanaëcia supercilia*. (Tab. XV., fig. 8 ♂.)

*Tanaëcia supercilia*, Butler, Proc. Zool. Soc. 1868, p. 610, n. 4, t. 45, f. 7.

This species or variety is founded on a Penang specimen contained in the collection of Lieut. Roberts. As I have not seen this type, nor met with an example in any other collection, I have had Mr. Butler's figure reproduced, and copy his original description.

"♂. Valde affinis *T. varuna*; alæ supra velut in *T. pelea* coloratæ, at fascia posticarum lunulari magis arcuata et characteribus basalibus punctiformibus; alæ subtus pallide fusæ, area interno-basali anticarum flavescente, fascia sericeo-albida discali, maculis posticarum latioribus nigris; aliter velut in *varuna*.

"Exp. alar. unc. 2 $\frac{3}{4}$ ."

HAB.—Malay Peninsula. "Penang" (coll. Roberts).

I have followed Mr. Butler in treating this as a distinct species, and append the following remarks of his own in justification of that course:—"Lieut. Roberts has assured me that the nearly-allied species of the *Adolias* group are quite constant to their localities; otherwise I should have considered this to be a variety of *varuna*."\*

3. *Tanaëcia violaria*. (Tab. XV., fig. 9 ♀.)

*Tanaëcia violaria*, Butler, Proc. Zool. Soc. 1868, p. 612, n. 11, t. 45, f. 8; Druce, Proc. Zool. Soc. 1873, p. 345, n. 4.

This species is only known to me, and figured and described here, under precisely the same conditions as apply to *T. supercilia* (*supra*).

"♀. Alæ supra fusæ; anticæ velut in *pelea*, at margine toto fusco; posticæ fascia lunulari ad angulum ani inerescente submarginali apud apicem lunulis niveis, apud angulum ani purpureis, a lunulis fuscis intus limitatis, extus a maculis sagittatis fuscis extra albido terminatis præcipue apud apicem."

"Alæ subtus velut in *pulasara* at area basali fusco-flavida (nec ochreo-albida) sagittisque posticarum violaceis et longioribus."

"Exp. alar. unc. 3 $\frac{1}{4}$ ."

HAB.—Malay Peninsula. "Singapore" (coll. Roberts).—Borneo (Druce).

4. *Tanaëcia pulasara*. (Tab. XIX., fig. 6 ♂; Tab. XIV., fig. 13 ♀.)

*Adolias pulasara*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. i. p. 190, n. 382 (1857); Trans. Ent. Soc. ser. 2, vol. v. p. 71, n. 16, t. 6, f. 2 (1859).

*Tanaëcia pulasara*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 540, n. 2 (1877).

*Tanaëcia varuna*, Butl. (nec Vollenhov.) Proc. Zool. Soc. 1868, p. 611, n. 5.

Male. Wings above fuliginous-brown. Anterior wings with the cell crossed by four blackish lines, followed by a similar but waved line a little beyond apex; between the last two lines the colour is somewhat violaceous, the markings beneath cell being much as in the preceding species; a transverse series of six large oblong greyish spots on apical half of wing, placed between the nervules, the upper five of which are margined with fuscous and conically rounded inwardly and acutely excavated outwardly,

\* The same writer, however, does not always follow this course, as in describing the large collection of Lepidoptera made in Chili by Mr. Edmonds, he remarks that in some instances he had described as distinct species what the collector "evidently only regarded as varieties, but it would indeed be remarkable if the collector should be always correct in his views as to the extent of variability in each species" (Trans. Ent. Soc. 1882, p. 113). This is good evidence as to how our so-called species depend upon the synthetic or analytic bias of the mind of the describer.



the third spot being smallest, the sixth situate between the third median nervule and the submedian nervure is doubly angulated outwardly and irregularly truncate inwardly; these are followed by an elongate spot or streak on inner margin, and are all more or less suffused with brownish and outwardly followed by five small violaceous and inwardly pointed spots, the nervules surrounding which are distinctly infuscated to margin. Posterior wings with the cell crossed by two black lines near base and two near apex, the last being followed by a small black streak on each side of second median nervule; a transverse series of seven spots on apical half of wing smaller and more regular, but margined and inwardly rounded and outwardly angulated as on anterior wing,—of these spots the upper three are greyish and outwardly margined with violaceous, the remainder being concolorous with wing; abdominal margin much paler and somewhat pinky. Wings beneath pale and violaceous. Anterior wings with the basal half ochraceous, with the dark linear markings generally as above, the large transverse spots on apical half as above, but more fused, and the pale colour extending to outer margin. Posterior wings with the cellular and adjacent markings as above; a curved black line above and near base of subcostal nervure, and an oblique series of three small black spots separated by the subcostal nervules a little beyond cell; the transverse spots on upper side only indicated by their black terminal margins, which form two transverse series of spots, between which the colour is tinged with ochraceous. Body and legs more or less concolorous with wings.

Female. Wings above generally resembling those of male. Wings beneath pale ochraceous; anterior wings with the greyish spots as above, but clearer and with the pale colour extending beyond their outer margins; posterior wings marked as above, but paler and with an additional series of three looped dark lines placed near cell and divided by the subcostal nervules, and three small spots beneath the median nervure, divided by the second and third median nervules.

Exp. wings, ♂ 68 millim.; ♀ 75 millim.

HAB.—Malay Peninsula; Penang (Brit. Mus. and ex coll. Chapman); Malacca (Pinwill—Brit. Mus.); Singapore (Brit. Mus. and Wallace—coll. Dist.)

*Var. a.* (Tab. XVIII., fig. 9 ♀.)

*Adolias Indras*,\* Vollenhoven, Tijds. Ent. v. p. 194, t. 11, f. 2 (1862).

Female. Closely allied to the typical form of *T. pulasara*, but differing in having the transverse series of greyish spots on anterior wings more slender and elongated, the fourth and fifth being much longer than the corresponding spots in Moore's species, the outer dentate margins are also longer and more acute; the transverse spots on posterior wings are more linear and elongate, particularly the two which are divided by the second median nervule, and their outer dentate margins are also longer and more acute. These characters also apply to the under surface of the wings.

Exp. wings, ♀ 78 millim.

HAB.—Malay Peninsula; Malacca (coll. Gosse). Borneo (Voll.)

This species appears to be almost confined to the Malay Peninsula; both the typical male and female specimens here figured being from Singapore, whilst the variety (*T. indras*) was collected in Malacca. Of the last Mr. Butler, † from a knowledge derived from Vollenhoven's figure alone, remarked, "this is only the Bornean form of Moore's *pulasara*," a statement which this Malaccan specimen considerably qualifies. ‡

\* In connection with this name Vollenhoven observes, "Indras, de god van het uitspansel bij de Hindoes."—"Indra, however, is the usual way in which the name of the Hindu god of the atmosphere is spelt."

† Proc. Zool. Soc. 1868, p. 612.

‡ Another closely-allied species, or variety, of *T. pulasara* is found in Sumatra, and has been described under the name of *T. vikrama*, Feld.

Females of the typical form of the species are also variable in hue, as in some specimens the transverse series of pale spots on the upper surface of the anterior wings are outwardly margined with small pale violaceous angulated spots, which are absent in the somewhat melanic specimen here figured.

5. *Tanaëcia aruna*. (Tab. XV., fig. 7 ♂.)

*Adolias Aruna*, Felder, Wien. Ent. Mon. iv. p. 400, n. 24 (1860).

*Adolias Pardalis*, Voll. Tijd. Ent. v. p. 197, n. 17, t. 11, f. 5 (1862).

*Tanaëcia aruna*, Butl. Proc. Zool. Soc. 1868, p. 611, n. 6; Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 540, n. 1 (1877).

Male. Closely allied to the preceding species (*T. pulasara*), but the transverse series of spots on the upper side of both wings paler and larger, those of the anterior wings having a central waved narrow brown fascia, and those on posterior wings being also paler and having their outer margins a little nearer to the posterior margin. Wings beneath more ochraceous, and with a narrow, distinct intermediate dark ochraceous fascia between the dark terminal margins of the transverse spots as seen on the posterior wings.

Exp. wings, 60 millim.

HAB.—Malay Peninsula; Malacca (Felder; Pinwill—Brit. Mus.)

The figure is taken from a Malaccan male in the British Museum, which was collected by Capt. Pinwill; the female has yet to be described, but is probably somewhat similar to the other sex, and not more divergent than are the sexes of the closely-allied species *T. pulasara*.

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*Tanaëcia robertsi*.

*Tanaëcia Robertsii*, Butler, Cist. Ent. i. p. 235 (1874).

Of this species I know nothing, save the following description, as no figure was given, and the type is in a private collection:—

“Male. Wings above pale olive-brown; apical half pearly white, bounded just beyond end of cell by an irregular blackish undulated line; a second zigzag line across centre of disc, interrupted on lower discoidal interspace of primaries; a series of submarginal hastate black markings; margin rather broadly pale brown; ring-like characters at base, as usual, blackish; body brown; underside much paler, the brown area altered to pale ochraceous; the black lunated lines of disc broken up into spots, the hastate markings only sharply defined at their apices; basal markings as above, but more sharply defined on secondaries; body pale ochraceous.”

Exp. wings, “2 inches 6 lines.”

HAB.—Malay Peninsula; “Malacca, Ayerpanas (H. Roberts).”

“Most nearly allied to *T. supercilia*, Butl., but smaller, with the entire externo-discal area of all the wings pearly-whitish, and the hastate submarginal markings distinctly separated from one another, as in *T. violaria*.”

## Genus EURIPUS.

*Euripus*, Westwood, Gen. Diurn. Lep. p. 293 (1850).

Anterior wings in the male subtriangular, the costal margin moderately arched and convex, the apical angle rounded, the outer margin sinuated and concave near centre, and generally slightly gibbous near apex of third median nervule, inner margin nearly straight; in the female the anterior wings are elongated, and the outer margin rounded and convex. First subcostal nervule emitted a little before end of cell; second emitted some distance beyond cell, but before the apex of costal nervule; third emitted at about same distance from second as second is from end of cell; fourth and fifth bifurcating at about one-fourth from apex and extending to outer margin; lower disco-cellular nervule obsolete, leaving the cell entirely open; median nervule robust, the first median nervule with its base more strongly arched in the male than in the female. Posterior wings subovate, the costal margin obliquely convex; the outer margin in the male strongly waved and scalloped, and at the apices of the discoidal and first median nervules developed into a distinctly caudate but truncate prolongation; in the female the outer margin is waved and slightly scalloped, but not caudate; abdominal margins divergently oblique to anal angle. Subcostal nervules emitted at a little less distance from each other than the first is from base of subcostal nervule; lower disco-cellular nervule entirely obsolete. Antennæ long, with a gradually formed elongate club. Palpi obtusely pointed, obliquely porrect, and not raised above the middle of the eyes.

This genus is of small extent and really belongs to the south-eastern portion of the Asiatic Continent, and extends through some of its Eastern Islands. In Continental India several species are found in the north-eastern districts;\* it is apparently absent from Ceylon and the Andaman and Nicobar Islands; two species occur in the Malay Peninsula, and the genus is also recorded from Borneo, Celebes, Philippines, and Japan.†

Like *Euthalia*, *Euripus* exhibits the greatest sexual dissimilarity in its species, and, as in the first-named genus, the males of several species are very closely allied, and the strongest specific differentiation is found in the females. These are "mimickers" of species of *Euphlea*, and their habits corroborate this view. Thus Mr. de Nicéville, who collected in Sikkim, mistook females of *Euripus halitherses* for specimens of *Euphlea rhadamanthus*, which he states "they evidently mimic, not only in form and coloration, but also in the slow-flapping flight and the habit of settling in open places so characteristic of *Euphleas*,"‡ and he again remarks that the male, which is not thus protected, "has a rapid flight, and never settles with expanded wings in conspicuous places, as the female does."§ This is a good illustration of the postulate made by Mr. Bates, of one explanation of sexual dissimilarity, as the advantage in Nature that accrues to "the possession of some peculiar colour, or form, or habit, by one sex to enable it to escape dangers peculiar to itself, owing to its haunts being somewhat different from those of the opposite sex."||

\* It is apparently not found in North-Western India, as Mr. Moore has neither included it amongst the genera collected by Capt. Lang (Proc. Zool. Soc. 1865), nor enumerated it in those collected by the Rev. J. H. Hocking (Proc. Zool. Soc. 1882).

† Amurland must also be added if we place the species described by Menetries (Ad. Schrenkii) in this genus, as has been done by Mr. Kirby (Syn. Cat. Diurn. Lep. p. 228, n. 9), but most other writers have retained it in *Euthalia*.

‡ Journ. Asiat. Soc. Beng. vol. L., Pt. 2, p. 51 (1881).

§ Ibid. p. 57.

|| Proc. Ent. Soc. Philad. vol. iv. p. 205 (1865).

1. *Euripus euplæoides*. (Tab. XIII., fig. 6 ♂; fig. 7 ♀.)

*Euripus euplæoides*, Felder, Reise Nov. Lep. iii. p. 415, n. 638 (1866); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541, n. 1 (1877).

Male. Wings above very dark indigo-blue. Anterior wings with the following white markings and spots; two linear streaks at base of cell, and a large irregularly shaped spot at its termination, which is deeply cleft at its centre; beneath these are a large subquadrate spot between the second and third median nervules, a series of four linear spots divided by the nervules beyond cell, the lower one very small, and a curved submarginal series, which are centrally cleft and situate between the nervules (between the third median nervule and submedian nervure there are three spots, which are outwardly followed at margin by a few very small pale bluish spots). A long pale bluish streak commencing near base and running above the submedian nervure, and a shorter streak of the same colour near apex of inner margin. Posterior wings with a very large white spot occupying the larger portion of cell, and narrowly attenuated and extending between the discoidal and first median nervules; on inner side of this are two long and linear white spots divided by the lower subcostal nervule; the upper of these is followed by a whitish spot, and the lower by two very small bluish spots, a pale streak on each side of third median nervule, a long irregular and posteriorly bifid streak on inner side of submedian nervure, and a marginal and submarginal row of small pale bluish spots placed in pairs between the nervules; abdominal margin white, containing two curved fuscous lines. Wings beneath pale olivaceous-brown; anterior wings with the markings as above, but larger, especially the spots beyond the cell, which almost coalesce with the submarginal series; posterior wings marked as above, but with an additional linear spot above the upper subcostal nervule, followed by a subquadrate spot near apex; the posterior angle of the anterior wings and the margin of the posterior wings between the discoidal nervule and the anal angle is indigo-blue as above. Body above indigo-blue; the eyes castaneous; head and thorax spotted and streaked with pale bluish; abdomen with two prominent basal spots and the posterior segmental margins of the same colour; abdomen beneath marked much as above; thorax beneath spotted with whitish, femora streaked beneath with the same colour; anterior legs white, annulated with indigo-blue.

Female. Wings pale brownish; anterior wings with the following whitish spots and markings:—a narrow subcostal streak, a basal streak in cell, and a transverse spot at its termination; an oblique macular fascia composed of four large spots beyond cell, above which is a small costal spot, and beneath which are a submarginal series of three spots, one above and two beneath the third median nervule; a marginal series of small spots which become linear at apex; posterior wings with the inner basal half whitish, and with the following markings of the same colour; a linear streak on each side of the lower subcostal nervule above cell, an irregular submarginal series placed between the nervules (two between the third median nervule and submedian nervure), and a marginal series of smaller spots. Wings beneath as above. Body and legs coloured and marked as in male, but paler.

Exp. wings, ♂ 56 millim.; ♀ 77 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Felder; Pinwill—Brit. Mus.)

The female of this species evidently “mimics” the same sex of *Euplæa dioeletiana*, Fabr., and doubtless thereby obtains similar immunity from the attacks of birds and other enemies as is possessed by that inedible species. The figure of the female is taken from a specimen in the British Museum, which was collected by Capt. Pinwill in Malacca. *E. euplæoides* is clearly a local race of *E. halitherses*, D. & H.

2. *Euripus pfeifferæ*.\*

*Euripus Pfeifferæ*, Felder, Wien. Ent. Mon. iv. p. 235, n. 82, t. 3, f. 1 (1860).

As I only know this species by Felder's figure and description, I here reproduce both, a course necessary and justifiable when neither are capable of exact verification with specimens.

"♀. Alæ anticæ margine externo convexo, supra fusæ, basi dilutiores, extus obscuriores, purpureoque tinctæ, macula ad cellulæ extimum sæpius obsoleta fasciaque transversa abbreviata subcostali, venis in maculas quatuor subelongatas divisa (infima minore) albis. Alæ posticæ remote exciso-dentatæ, supra purpureo-fusæ, costa limboque interno dilutioribus, macula cellulari elongata atomaria alba (sæpius striis etiam binis interioribus concoloribus). Alæ subtus saturate brunneæ, maculis marginalibus ellipticis seriatis albis cæruleo-atomatis, anticæ intus lilacino tinctæ, macula fasciaque paginæ superioris, maculis duabus atomariis versus angulum internum cærulescentibus, posticæ macula striisque paginæ superioris plus minusve distinctis, maculis septem exterioribus albis cæruleo atomatis nigroque cinctis, linea angulum formante digestis (prima majori). Abdomen supra nigrum, maculis lateralibus aliisque ventralibus biseriatis albis."

Exp. wings, 70 millim.†

HAB.—Malay Peninsula; "Singapore."



Fig. 42. *Euripus pfeifferæ*, ♀.

## Genus EURYTELA.

*Eurytela*, Boisduval, Faun. Madag. p. 54 (1833); Westw. Gen. Diurn. Lep. p. 408 (1851); Trim. Rhop. Afr. Austr. p. 211 (1866).

Anterior wings subtriangular, the costal margin arched and convex, the apical angle broadly subtruncate, the outer margin oblique, concavely sinuated beneath apical angle, and somewhat convex at posterior angle; inner margin nearly straight, slightly convex, and dilated near base. Costal nervure greatly swollen at the base; first and second subcostal nervules emitted before, but near the extremity of the cell; third emitted at rather less than half the distance between extremity of cell and apex;

\* This species was brought from Singapore by Mad. Ida Pfeiffer, after whom it was very properly named by Felder, who observes (Wien. Ent. Mon. iv. p. 235):—"We have often deplored that her collection, obtained from so many sources with such wonderful application, should again be distributed in all directions, so that it is impossible, even in her own country, to succeed in reuniting them."—This is unfortunately too true of most collections. Could they be retained and studied as a whole much misconception as to so-called species and varieties would be avoided, and we should better know the geographical range of some of the common species. Unfortunately such collections are usually "picked" by different specialists, their desiderata being alone eliminated, while the residue usually receive no scientific treatment whatever. Consequently faune are very imperfectly represented in some of the best collections, owing to the commoner or wide-ranging species not being retained. These remarks are particularly applicable to the splendid collection of Rhopalocera made by Mr. Wallace in the Malay Archipelago, which are now (and, under the circumstances, inevitably) distributed in all parts.

Mad. Pfeiffer is well described by Felder (*ibid.*) as "that marvellous woman, driven by an unconquerable love of travel." According to Petermann ('Athenæum,' 6th Dec. 1851), "It took her twenty years to save enough money to perform her first journey." In all her wanderings she ardently collected insects, and in Borneo, when she accompanied Spencer St. John to visit the Dayaks of Sirambau, that author relates that amongst the inhabitants "Madame Pfeiffer was a great attraction, and a crowd followed her everywhere, and wondered at the eagerness she displayed in the chase of a butterfly or the capture of an insect" ('Life in the Forests of the Far East,' vol. i. p. 153).

† Taken from Felder's figure only.

fourth and fifth bifurcating at about two-thirds beyond cell and extending laterally to apical margin. Upper disco-cellular nervule short and oblique; middle disco-cellular curved and oblique, not much longer than first; lower disco-cellular, slender, suberect, and uniting with median nervule at base of first median nervule, which is curved outwardly at base, and possesses an apparently common origin with the second. Posterior wings subovate or subtriangular; costal margin very oblique, nearly straight, and but slightly convex, outer margin rounded and scalloped, abdominal margin oblique from end of body to anal angle; precostal nervule suberect: first subcostal nervule emitted a little before, and the second subcostal emitted at upper extremity of the cell; lower disco-cellular nervule slender and rudimentary, apparently almost closing cell. Body of moderate size; antennæ slender with a short club obtusely pointed at the tip; palpi elongate, slender and porrect.

This may be considered an African genus, for it is on that continent and Madagascar that its focus or head-quarters are found. Two species alone are recorded from the East, and both of these inhabit the Indo-Malayan region, though not altogether confined to it, as one species occurs in the Andaman Islands.

The position of this and the following genus *Eryolis* in the *Nymphalina* is a somewhat aberrant one, owing to the dilatation of the costal nervule—a character which is principally found in the *Satyrine*. Prof. Westwood placed both in the family *Eurytelidæ*,\* a very heterogeneous group, and one now seldom used, though I am not at all satisfied with the position in which I have placed these genera here.

We know little of the transformations of the species of this genus. Mr. Gooch † states that the larva and pupa of an African species, *E. liarbas*, as found in Natal, are “both conspicuous by their forms. The larva has two long divergent clubbed and rough horns on its head, and the pupa is remarkable by its angulated, excavated, and alated development.” He also remarks that “he did not establish sexual difference of markings in the larvæ, although some were green with black marks, and others were green all over.” This was probably a developmental and not sexual phase.

1. *Eurytela castelnaui*. ‡ (Tab. XV., fig. 10.)

*Eurytela Castelnaui*, Felder, Wien. Ent. Mon. iv. p. 401, n. 26 (1860); Reise Nov. Lep. iii. t. 61, f. 5, 6 (1866); Wall. Trans. Ent. Soc. 1869, p. 331, n. 1.

Not having received this species from the Malay Peninsula, I have given a copy of Felder's figure, and here append his description:—

“Alis inter cilia albo lunulatis, supra cyaneis, striga submarginali undata nigra, subtus obscure brunneis, basi extusque albido variegatis, strigis tribus communibus discalibus fuscis. ♂.”

“*Eur. Horsfieldii*, Boisd., forsitan affinis.”

HAB.—Malay Peninsula (Felder); Singapore (Wallace).—Sumatra (Smith §).—Borneo (Wallace).

\* Gen. Diurn. Lep. p. 403. The *Eurytelidæ* were first separated by Doubleday (Cat. Lep. Brit. Mus. p. 143).

† ‘Entomologist,’ vol. xiv. p. 37.

‡ This species is named after Fras. F. de Laporte, Comte de Castelneau, better known, under the name of Laporte, as an entomologist of renown and an accomplished naturalist. Official duties carried him to almost, if not to all, the quarters of the world at least, and in all he pursued his natural-history studies. The above species was probably collected during an excursion made to Malacca whilst he held the position of French Consul at Siam. He died at Melbourne in 1880, whilst presiding at that Consulate, in his seventieth year.

§ In Bock, “Head Hunters, Borneo.” Append. V.

## Genus ERGOLIS.

*Ergolis*, Boisduval, Spec. Gén. i. t. 4, f. 4 (1836); Westw. Gen. Diurn. Lep. p. 409 (1851); Moore, Lep. Ceyl. i. p. 43 (1881).

*Ariadne*, Horsf. Cat. Lep. E. I. C. t. 6, f. 2 (1829).

Anterior wings large, subtriangular, the costal margin much arched, apex subacute, the apical angle oblique; outer margin more or less convex, wavy and sinuated; the inner margin nearly straight, more or less overlapping and convex at base. Costal nervure greatly swollen at the base; subcostal nervules arranged almost as in *Eurytela*, but the middle disco-cellular nervule considerably longer than the upper; the lower disco-cellular nervule curved outwardly above and inwardly below. Posterior wings very broad; costal margin oblique and very slightly convex and slightly gibbous near base; outer margin rounded, convex, and strongly wavy; neuration generally as in preceding genus. Body of moderate size; palpi porrect, slightly curved, extending considerably beyond the head, and not elevated above the middle of the eyes; antennæ slender, with an apical slight and gradually formed club.

*Ergolis* is not only allied to *Eurytela*, in possessing the common and aberrant character of dilatation of costal nervure, but like that genus it is also found in both the Ethiopian and Oriental regions. Unlike *Eurytela*, however, it is as well or better represented in the last than in the first-named region.

We are indebted to the late Dr. Horsfield for a drawing of the larva of *E. ariadne*, as found in Java,\* which somewhat agrees with the general structure of the African species of *Eurytela*, described by Mr. Gooch (*ante*, p. 136), in possessing bifid spines to the head. On this subject Mr. Wallace has remarked that, as the larval structure "agrees with the *Junonia* type," while the neuration is so distinct "it seems probable therefore that, as we know sometimes happens, the larva alone has become modified, so as to resemble a group with which it has no direct affinity." †

Mr. Wallace describes the butterflies of this genus as frequenting open situations "fluttering among herbage, and having much the habit of the more active *Satyridæ*." ‡

1. *Ergolis ariadne*. (Tab. XI., fig. 6 ♀.)

*Papilio Ariadne*, Linnæus, Syst. Nat. i. 2, p. 778, n. 170 (1767); Joh. Amœn. Acad. vi. p. 407, n. 71 (1764);

Fabr. Syst. Ent. p. 507, n. 267 (1775).

*Biblis Ariadne*, Godt. Enc. Méth. ix. p. 327, n. 6 (1819).

*Papilio Coryta*, Cram. Pap. Ex. i. t. 86 E F (1779).

*Ariadne Coryta?* Horsf. Cat. Lep. E. I. C. t. 6, f. 2 (1829).

*Ergolis Coryta*, Boisd. Sp. Gén. i. t. 4, f. 4 (1836).

*Ergolis Ariadne*, Horsf. & Moore (excl. *Merione*, Cram.), Cat. Lep. Mus. E. I. C. i. p. 144, n. 293 (1857).

*Ergolis Coryta*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 144, n. 294 (1857)

*Ergolis Ariadne*, Butl. Cat. Fabr. Lep. p. 70, n. 2 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 1 (1877); Wall. Trans. Ent. Soc. 1869, p. 332, n. 1; Druce, Proc. Zool. Soc. 1873, p. 342, n. 1; *ibid.* 1874, p. 105, n. 1; Snellen, Tijds. Ent. xix. p. 146, n. 17 (1876); *ibid.* xxi. p. 9, n. 29 (1878).

\* Cat. Lep. E. I. C. t. 7, f. 6 (1829); copied by Boisduval, Sp. Gén. i. t. 4, f. 4 (1836).

† Trans. Ent. Soc. 1869, p. 332.

‡ *Ibid.*

Male and Female. Rufous or ochraceous.\* Anterior wings with a small white subapical spot placed just above the bifurcation of the fourth and fifth subcostal nervules, and with the cell crossed by the following dark markings:—a short and nearly straight basal line continued to submedian nervure, a double-looped and much-waved line at centre, and two longer, waved, and more widely separated lines at apex; two waved discal fuscous lines crossing both wings, commencing about subcostal nervure of anterior wings, and terminating near submedian nervure of posterior wings; on both wings these are followed by a waved and more indistinct line, and again by a very dark and sinuated submarginal line; a similarly dark marginal line, the fringe somewhat alternately greyish. Wings beneath very dark ochraceous or pale castaneous, crossed by three very irregular dark fasciæ, the first near base, the second crossing the wings about cellular apices, the third between the last and outer margin; these fasciæ have their margins darker, and the third encloses a series of dark spots placed between the nervules (these are most distinct on the posterior wings); marginal and submarginal lines as above, and the subapical white spot to anterior wings very distinct. In male specimens the area of the median nervules, on the under surface of the anterior wings, is shining greenish fuscous. Body and legs more or less concolorous with wings.

Exp. wings, ♂ & ♀ 50 to 54 millim.

HAB.—Continental India; N.W. Himalaya (Hoeking); Assam; Madras (Horsf. & Moore).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.)—Sumatra (Wallace).—Java (Wallace); Batavia (Snellen).—Borneo (coll. Godm. & Salv.); Sandakan (Pryer—coll. Dist.)—Flores (coll. Dist.)—Timor (Wallace)—Celebes (Snellen).—Siam; Nahconchaisee (Druce).—Formosa (Brit. Mus.)

As previously stated (*ante*, p. 137), the larva has been figured by Dr. Horsfield, who wrote † that it “feeds on the Jarak (*Ricinus communis* ‡), December.”

A closely allied form from Ceylon has been described by Mr. Moore under the name of *Ergolis minorata*. §

## 2. *Ergolis merione*. (Tab. XV., fig. 6 ♀.)

*Papilio Merione*, Cramer, Pap. Ex. ii. t. 144 G H (1779).

*Ergolis Merione*, Butl. Cat. Fabr. Lep. p. 70, n. 3 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 2 (1877); Wall. Trans. Ent. Soc. 1869, p. 332, n. 2.

Male and Female. Wings above warm ochraceous. Anterior wings with a subapical white spot placed above the bifurcation of the fourth and fifth subcostal nervules, and with the following blackish markings:—two lines crossing cell near base, the outer one continued to submedian nervure; two waved and zigzag lines crossing centre of cell, and continued to submedian nervure; three waved lines at end of cell not passing median nervure; a pair of curved and very zigzag lines crossing disk at about centre of wing, followed by another very waved line, commencing near the subapical white spot; a submarginal series of three waved lines, the inner one faint and somewhat macular; the outer margin black, with the fringe alternately greyish. Posterior wings with the markings similar and generally continuous to those of the anterior wings, but the inner of the three submarginal lines replaced by a series of castaneous spots placed between the nervules, sometimes at and along the median nervules, divided by the junction of the anterior and posterior waved lines. Wings beneath duller and slightly darker than above, the spaces between the waved lines (excluding the submarginal ones) castaneous, thus showing two

\* The specimen figured is a very pale female from Province Wellesley, the usual colour being more rufous above, with the markings much darker beneath.

† Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 145.

‡ The castor-oil plant. According to Crawford this plant is cultivated throughout the Malayan Archipelago:—“The most frequent name for it is *jarak*, and such we find it in the Malay and Javanese, but in the Sunda and Madurese languages it is called *kaliki*” (Descript. Dict. Indian Islds. p. 369).

§ Lepid. Ceyl. i. p. 44, t. 23, f. 2, 2a.



very prominent and dark fasciæ on disk, and a narrower and paler one near base of both wings. Body and legs more or less concolorous with wings.

Exp. wings, ♂ & ♀ 55 to 60 millim.

HAB.—Continental India; North-Eastern Provinces (coll. Dist.)—Malay Peninsula; Penang (coll. Moore); Province Wellesley (colls. Dist. & Sauer); Malacca (Pinwill—Brit. Mus.)

This species is easily distinguishable from the last by the much less angulation of the anterior wings, the different and zigzag markings, and its generally larger size.

According to the specimens now before me, the subapical white spot to the anterior wings is more prominent in the female than in the male sex.

### *Ergolis isæus*.

*Ergolis Isæus*, Wallace, Trans. Ent. Soc. 1869, p. 333, n. 4.

As I do not know this insect, I can merely give Mr. Wallace's description:—

“Outline of wings nearly even, with an angular lobe on the upper wings, waved striae somewhat as in *E. Coryta*,\* but disposed in pairs, no white spot near the apex; on the hind wings a series of distinct sublunulate ring markings, each enclosing an obscure reddish spot. Beneath, upper wings dusky, the disc reddish brown, the borders pale, a dusky streak parallel to the outer margin; lower wings pale brown, the markings as above, but the lunulate ring spots smaller, the outer border ashy brown.”

“The female is like the male, but paler, especially beneath.”

“Size of *E. Coryta*.”

HAB.—Malay Peninsula; ‘Singapore.’—‘Sumatra’ (coll. Wall., type).”

“This species has probably been confounded with *E. Coryta*, from which the even outline of the wings and the absence of the white spots at once distinguish it.”

### Genus CYRESTIS.

*Cyrestis*, Boisduval, Voy. Astrol. Lep. p. 117 (1832); Westw. Gen. Diurn. Lep. p. 260 (1850).

Wings pale and delicate; anterior wings subtriangular, the costal margin strongly arched, the outer margin irregular, waved, sinuated, or slightly convex; inner margin slightly rounded, convex at base, and slightly concave beyond the middle. Costal nervure extending to about the middle of the costal margin; first and second subcostal nervules emitted before the end of cell (the second being very near its extremity), second much longer than first; third emitted about two-thirds beyond end of cell; fourth and fifth widely divergent, and bifurcating about midway between base of the third and apex. Lower disco-cellular nervule very slender, suberect, slightly curved inwardly, and indistinctly closing cell, which thus forms a triangle. First median nervule strongly arched, and with an apparently common origin with the second. Posterior wings elongated, sometimes somewhat hexagonal; the costal margin nearly straight, becoming rounded and convex towards apical angle, or as in typical species concavely emarginate at that spot: outer margin more or less sinuated to extremity of first median nervule, where it is narrowly prolonged in caudate elongation; from thence to anal angle it is somewhat truncate, the anal angle being spatulately produced; the abdominal margin more or less concavely emarginate before the anal angle. Precoastal nervure slender, curved outwardly; costal nervure obliquely erect at base, and then extending to near apex; lower disco-cellular nervule aborted, in some specimens very faintly visible. Body small and slender. Antennæ very slender, terminated by an elongated and gradually formed slender club. Palpi long and strongly porrected.

\* As previously pointed out, this is a synonym of *E. ariadne*.

*Cyrestis* is a genus of not inconsiderable extent, which, although represented in W. Africa and Madagascar, has its head-quarters in the Oriental region. It is found in Continental India, the Andaman Islands, Burma, Tenasserim, and in, and from, the Malay Peninsula, throughout the length and breadth of the Malayan Archipelago; it has also recently been received from New Ireland.

As regards the habits of one species of this genus (*C. thyodamas*), we possess much interesting information. Capt. Lang describes having, in the N.W. Himalaya, "watched its elegant soaring flight, far out of reach, as it floated over the blossoms of the horse-chestnut (*Pavia indica*), or rested on its broad leaves in the sunshine," or again "floating up and down the foliage-covered face of a steep cliff overhanging a hill-torrent."\* In the same district the Rev. J. H. Hocking found it from "June to September," and states that it "hibernates afterwards," and "sits with open wings upon hanging leaves of oak and rhododendron."† In Sikkim Mr. de Nicéville observed this and a species of the next genus (*Chersonesia risa*) as having "the habit of suddenly settling with wings wide outspread, on the *underside* of a leaf parallel to the ground, where [they are] completely hidden." "This feat of gymnastics," Mr. de Nicéville observes is, in his experience, confined to these genera alone, and must be a great protection from enemies, as "the disappearance of the insect is so rapid that unless one has actually watched it settle on the leaf it seems like magic."‡

The writer is unacquainted with any description of the transformations of the species of this genus.

### 1. *Cyrestis nivea*, var. *nivalis*. (Tab. XII., fig. 3 ♂.)

*Amathusia Nivea*, Zinken-Sommer, Nova Acta Ac. Nat. Cur. xvi. p. 138, t. 14, f. 1 (1831).

*Cyrestis Nivalis*, Feld. Reise Nov. Lep. iii. p. 414, n. 634 (1866).

*Cyrestis nivea*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 2 (1877).

Male. Wings above pale creamy white; both wings crossed by three obliquely waved fuscous lines commencing about costa of anterior wings, the first near base, the second a little beyond cellular apices, both angularly terminating on abdominal margin, the third crossing wings at centre and terminating at third median nervule of posterior wings; anterior wings with a broad but irregular fuscous costal margin from the central fuscous line to base, with an ochraceous basal costal streak; cell crossed by a fuscous line near base, and with two very slender and waved fuscous lines at about apex; a broad apical fuscous patch and a broad outer margin of the same colour, terminating near third median nervule, the first inwardly containing two waved pale lines with an inner grey spot, and the second possessing three pale submarginal lines; between second and third median nervules is a submarginal and subovate fuscous spot, with an inner grey spot and inner pale margin, and this spot is connected with the apical patch by a waved fuscous line; near posterior angle is an ochraceous spot, with a sinuate fuscous inner margin and two small central fuscous spots; posterior wings with a submarginal fuscous fascia divided by a central pale line, followed by a fuscous line which becomes waved beneath the discoidal nervule; a short straight fuscous fascia from apex to first median nervule, a submarginal fuscous line very broad at area of median nervules, and the margin at apex and also at caudate prolongation fuscous; basal half of abdominal margin pale fuscous, and apical half of abdominal margin and internal anal-angular area

\* Ent. Mon. Mag. i. p. 132.

† Proc. Zool. Soc. 1882, p. 240.

‡ Journ. Asiat. Soc. Beng. vol. L. pt. 2, p. 57 (1881).

ochraceous, marked with several fuscous spots and pale lines. Wings beneath as above, but with the fuscous markings paler, and quite absent from costal margin of anterior wings and abdominal margin of posterior wings. Head and thorax above fuscous, their lateral margins ochraceous; the first with the eyes castaneous, and the second with central pale longitudinal lines; abdomen fuscous, with ochraceous and greyish longitudinal markings; body beneath and legs more or less concolorous with wings.

Exp. wings, ♂ 44 to 50 millim.

HAB.\*—Malay Peninsula; Penang; Province Wellesley (coll. Dist. & Saüer).—Malacca (Com. de Castelnau—Felder; Pinwill—Brit. Mus.)

Although I have captured, received, and examined a long series of this species, I have as yet been unable to meet with the female sex. This is, however, most probably similar to the male, for though the *C. nivea* and *C. lutea* of Zinken-Sommer have been considered as the sexes of one species, still as I have examined male specimens of each of those species, that theory may be considered as disproved.

The variety *nivalis* differs from typical Javan specimens of *C. nivea* in not having a continuous fuscous margin to the anterior wings, and in the greater amount of ochraceous coloration near the anal angle of posterior wings.

## 2. *Cyrestis earli*.† (Tab. XIII., fig. 5 ♂.)

*Cyrestis Earli*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. ii. p. 174 (1883).

Male. Wings above creamy white, with the basal third of both wings slightly and palely infuscated, and with two narrow oblique brownish fasciæ:—the first commencing on median nervure and at about centre of cell of anterior wing, and extending to about centre of submedian nervure of posterior wings, down which it is continued to near anal angle; the second commencing on anterior wing at base of second median nervure, and extending to near apex of the third median nervure of posterior wings, whence it is strongly sinuated and angulated to submedian nervure. Cell of anterior wings with four transverse brownish fasciæ, the fourth at end of cell having a central brownish line; a similarly formed fascia closing cell of posterior wings; an irregular brownish patch beyond cell of anterior wings; at about one-third from apex a narrow brownish fascia crosses both wings. The apex of anterior wings is broadly infuscated; and a submarginal series of obscure spots (absent at centre of anterior wings) outwardly margined by a narrow brown fascia crosses both wings; a marginal blackish line; the extreme margin brownish, with creamy white fringe; an ochraceous patch at anal angle of posterior wings, on which are two bluish spots marked with black; caudate appendages bluish. Wings beneath much paler than above; markings generally similar, but spots darker, with a large black spot at anal angle of posterior wings, and the spots divided by the subcostal nervules of posterior wings and those between the second and third median nervules of anterior wings very prominent and black. Body and legs more or less concolorous with wings.

Exp. wings, 58 millim.

HAB.—Malay Peninsula; Malacca (coll. Godm. & Salv.)

*C. earli* holds a somewhat intermediate position between *C. sericeus*, Butl., and *C. paulinus*, Feld. Two Malaccan specimens in the collection of Messrs. Godman & Salvin (one of which is here figured and described) represent my whole knowledge of the species.

\* Of the var. *nivalis* only.

† Named after Geo. Windsor Earl, the author of the 'Eastern Seas,' the 'Native Races of the Indian Archipelago,' &c.

## Genus CHERSONESIA.\*

*Chersonesia*, Distant, *ante*, p. 86.

This genus is closely allied to *Cyrestis*, from which it principally and structurally differs by the neuration of the anterior wing, of which the first subcostal nervule only is emitted before the termination of the cell, the second being emitted between the apex of cell and base of third subcostal nervule; the other neural characters are similar to those of *Cyrestis*.

Two species are included in this genus, viz. *C. risa*, Doubl. & Hew., a species found in Continental India, and *C. rahria*, Horsf. & Moore, a Javan species, also found in Borneo and in this fauna. Its distribution is probably from Continental India to the confines of the Indo-Malayan region.

1. *Chersonesia rahria*. (Tab. XII., fig. 4.)

*Cyrestis Rahria*, Horsfield & Moore, Cat. Lep. Mus. E. I. C. i. p. 147, n. 301, t. 3 a, fig. 2 (1857); Westw. MS. in Doub. & Hew. Gen. Diurn. Lep. p. 262, n. 11 (1850); Druce, Proc. Zool. Soc. 1873, p. 343, n. 3; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 544, n. 1 (1877).

Male and Female. Wings above pale ochraceous, crossed by the following fasciæ:—a somewhat curved basal dark ochraceous fascia, margined with fuscous, commencing at about subcostal nervure of anterior wings and terminating slightly beyond submedian nervure of posterior wings; this is followed by a straighter but more irregular fascia of the same colour, which, commencing about costa of anterior wings, passes the cellular apices of both wings and terminates on posterior wings near centre of abdominal margin; between these fasciæ on anterior wings is a short irregular fascia commencing at costa and joining or almost joining the second fascia near median nervure; a discal curved fuscous fascia, margined with dark ochraceous, followed on anterior wings by a dark ochraceous spot, which precedes a submarginal fascia bounded by fuscous lines commencing beneath apex, the posterior half of which is dark ochraceous, and contains two fuscous spots, and the upper portion is preceded by a dark ochraceous patch also containing a fuscous spot; an oblique subapical fuscous linear spot and a fuscous submarginal line; posterior wings with a submarginal dark ochraceous fascia, margined by scalloped fuscous lines and containing a series of fuscous linear spots; a submarginal fuscous line preceded by paler and fuscous nebulous shadings. Wings beneath paler than above; markings similar, but the submarginal fasciæ to both wings without the dark outer margins. Body above ochraceous; thorax marked with some longitudinal fuscous lines, and abdomen with some narrow fuscous annulations. Body beneath and legs more or less concolorous with wings.

Exp. wings, 40 to 42 millim.

HAB.—Malay Peninsula; Penang (Brit. Mus.); Malacca (Pinwill—Brit. Mus.)—Nias Island (coll. Dist.)—Java (coll. Horsf.)—Borneo (Druce).

The figure represents a Malaccan specimen contained in the British Museum.

\* That the "Golden Chersonese" of some classical writers and the "Ophir" of Jewish history are both referable to the Malay Peninsula is the argument of a recent pamphlet by Mr. Dowden (London, 1882).

## Genus PARTHENOS.

*Parthenos*, Hübner, Verz. bek. Schmett. p. 38 (1816); Moore, Lep. Ceyl. i. p. 46 (1881).

*Minetra*, Boisd. Voy. Astrol. Lep. p. 126 (1832); Westw. Gen. Diurn. Lep. p. 265 (1850).

Anterior wings subtriangular and much elongated; costal margin moderately arched; apical angle rounded, the outer margin very oblique and scalloped; the inner margin oblique at base and slightly concave near centre. Costal nervure robust, extending about two-thirds the length of the wing; first and second subcostal nervules emitted before the end of cell, the first a little beyond middle of cell, the second a short distance before end of cell, the second becoming amplified and convex towards its apex; third emitted at about three-fourths from base, and also amplified and convex; fourth and fifth bifurcating a short distance from base of third; the fourth prominently angulated near its middle; middle disco-cellular nervule nearly straight, obliquely directed inwardly; lower disco-cellular very slender, obliquely concave, closing cell. Median nervules widely separated, the first slightly curved inwardly. Posterior wings subquadrangular and ovately elongate; costal margin nearly straight, obliquely rounded towards apex, the outer margin broadly scalloped, and most prolonged at apices of first and second median nervules; anal angle obliquely rounded. Precostal nervure forked anteriorly; costal nervure regularly arched from base; lower disco-cellular nervule more or less aborted, slender and indistinct. Body robust; abdomen small. Antennæ nearly straight, terminated by a very slender and gradually formed club. Palpi compressed and parallel.

This is a rather small genus (if we do not consider all the local varieties as of specific rank), which, found in Continental India, Ceylon, and the Andaman Islands, extends eastwards through the Malayan Archipelago to the Papuan Regions.

We have lately received our first knowledge of the transformations of a species of this genus from the excellent drawings of a Ceylon species made by the Bros. de Alwis, and published in Moore's 'Lepidoptera of Ceylon.'\* According to Mr. Hutchison, this butterfly "sits on large leaves with wings spread."† Capt. Mortimer J. Slater met with *P. gambrisius* at Dacca, "in the deepest jungle."‡

1. *Parthenos gambrisius*, var. *lilacinus*. (Tab. XI., fig. 7 ♀.)

*Papilio Gambrisius*, Fabricius, Ent. Syst. iii. 1, p. 85, n. 264 (1793).

*Minetra Gambrisius*, Doubl. & Hew. (nec. Fabr.), Gen. Diurn. Lep. t. 51, f. 2 (1850).

*Parthenos lilacinus*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 544 (1877).

Male and Female. Anterior wings above olivaceous; cell containing a basal lateral black streak curved downwards before the third median nervule, and connected with the subcostal nervure by a curved

\* Although this species is not found in the Malay Peninsula, it is at least a very open question whether both it and the Malaccan insect are not different varieties of the Indian *P. gambrisius*, and therefore the description of the larva and pupa as found in Ceylon may serve as a guide in the Malay Peninsula:—"Larva cylindrical, pale purplish brown, darker beneath, with dark brown longitudinal dorsal lines and transverse white spotted lines; head and anal segment spined, other segments slightly hairy; third to twelfth segments armed with branched spines, which are longest on third, fourth, eleventh and twelfth segments. Feeds on *Modecca*. Pupa pale purplish brown, somewhat fusiform; head pointed and cleft" (Lep. Ceylon, i. p. 47).

† Ibid.—This is an aberrant habit in the *Nymphalidæ* and other Rhopalocera, excepting many *Hesperidæ*, and is paralleled in Tropical America by species of the genus *Ageronia*.

‡ Horsf. & Moore, Cat. Lep. Mus. E.I.C. i. p. 148.

black line; a central pair of rounded oblique black lines posteriorly united, preceded by an angulated bluish spot, and followed by a transverse, elongate semihyaline white spot; beyond this is a black spot followed by an attenuated white spot directed inwardly, and a white spot immediately beyond cell (all these spots margined with black); an oblique discal series of ten white spots, divided by the nervules, the upper six linear, of which the fourth and fifth are inwardly broken by blackish; seventh and eighth large, the seventh being irregularly rounded, and the eighth subquadrate; ninth and tenth very small, and situate between the third median nervule and the submedian nervule in an area, which is bright bluish extending to the inner margin; the upper nine of these spots are margined with black, and are followed by a straight submarginal black fascia, and an equally broad but macular marginal fascia of the same colour; a black basal lateral fascia commencing between the third median nervule and submedian nervule, and continued across the base of posterior wings and thorax. Posterior wings with the basal third bluish, crossed by three lateral black fasciæ, of which the first is nearly straight and extends across the abdomen; the second slightly curved and suddenly and strongly attenuated between the subcostal nervules; the third narrow, curved, and macular, widening towards abdominal margin; beyond this the colour is olivaceous, with a submarginal series of triangular black spots placed between the nervules, each preceded by duplex black lines posteriorly and concavely connected: and followed by a black macular marginal fascia; abdominal margin subroseate. Wings beneath much paler than above; anterior wings marked as above, but with all the black markings only slightly indicated; posterior wings without the basal lateral black fasciæ as above, but with two black lines between the costal and subcostal nervures, and an irregularly waved and broken black discal line extending from upper subcostal nervule to third median nervule; this is followed by an obscure series of small blackish spots, a series of duplex linear spots as above, but smaller and outwardly margined with white, a narrow submarginal but broken black fascia, and a marginal series of black spots. Thorax above concolorous with the wings, with the anterior margin ochraceous, and with two broad black bands; abdomen above more or less ochraceous, banded and annulated with black; body beneath and legs more or less concolorous with wings.

Exp. wings, 92 to 100 millim.

HAB.\*—Malay Peninsula; Penang; Province Wellesley (colls. Dist. and Säuer); Malacca (Pinwill; Brit. Mus.)

Many reasons advocate the view that the *P. lilacinus*, Butl., is but a slight local variety of the *P. gambrisius*, Fabr. Already Mr. Moore has described the Tenasserim form under the name of *P. apicalis*,† and if these “species” are to stand then the Andaman, Sumatran, Bornean and other slightly varietal forms should also be placed in specific isolation.‡

#### Genus LEBADEA.

*Lebadea*, Felder, Neues Lep. p. 28 (1861).

Anterior wings subtriangular, elongate, and apically attenuated in the male, broader in the female. Costal margin arched and convex, the apical angle rounded, beneath which the outer margin (which is sinuate) is more or less concave; inner margin sinuate, oblique near base and slightly concave near centre, the outer margin distinctly longer than the inner margin. First subcostal nervule emitted a little

\* Of the variety *lilacinus* only.

† Proc. Zool. Soc. 1878, p. 829.

‡ If the principle of describing slight but constant local varieties as distinct species is to be commended, then logic would inexorably demand that those British species of Lepidoptera which vary with locality should also receive distinct names—an achievement which the boldest describer has not yet perpetrated. An excellent paper by Mr. R. M'Lachlan, containing general notes on variation in some British Lepidoptera may with advantage be consulted.—Trans. Ent. Soc. (1865), pp. 453—468; and also, and particularly, Mr. Jenner Weir's “Notes on the Macro-Lepidoptera of the Shetland Isles” (‘Entomologist,’ vol. xiii., p. 249, *et seq.*)

beyond centre, and the second a little distance before end of cell; third about midway between apices of cell and wing, and the fourth and fifth bifurcating a short distance beyond base of third; the second and third are more or less suddenly amplified and rounded; the fourth bent and angulated near its centre; disco-cellular nervules slender, closing cell; first median nervule rounded and with an apparently common origin with the second; second and third situate wide apart. Posterior wings subovate, the costal margin gibbous and angularly rounded near base, after which it is slightly oblique and convex to apex; outer margin rounded and waved; abdominal margin somewhat straight to abdominal apex, after which it is angulated and divergently oblique to anal angle; subcostal nervules emitted at a less distance from each other than the first is from base of subcostal nervure; lower disco-cellular nervule obsolete. Antennæ long, with a gradually-formed elongate club. Palpi moderately robust, hairy, porrect, and raised to about the upper level of the eyes.

This is a genus of small extent, and apparently confined to Continental India and the Indo-Malayan Region. I have found no record or description of either larva or pupa.

1. *Lebadea martha*. (Tab. XVII., figs. 10 ♂, 11 ♀.)

*Papilio Martha*, Fabricius, Mant. Ins. ii. p. 56, n. 555 (1787); Ent. Syst. iii. p. 139, n. 429 (1793).

*Aconthea Alankara*, Horsf. Cat. Lep. E.I.C. t. 5, f. 6 (1829).

*Limenitis Alankara*, Horsf. & Moore, Cat. Lep. E.I.C. i. p. 179, n. 364 (1857).

*Limenitis Martha*, Butl. Cat. Fabr. Lep. p. 59, n. 1 (1869).

*Lebadea alankara*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541, n. 1 (1877).

*Lebadea martha*, Druce, Proc. Zool. Soc. 1873, p. 343, n. 2; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541, n. 2 (1877).

Male. Wings above brownish ochraceous. Anterior wings with the cell crossed by three pairs of blackish lines, of which two are basal, two central enclosing a large whitish spot, and two at apex; beneath cell and between the third median nervule and submedian nervure are some black linear markings; beyond cell the wing is crossed by an irregular series of eight white spots divided by the nervules, of which the sixth and seventh are largest, and separated by the third median nervule; these are followed by a straight series of six lunulate white spots margined with fuscous, that beneath the third median nervule being duplex; apex somewhat broadly white; a waved fuscous submarginal line, margined with white, and commencing beneath the fifth subcostal nervule. Posterior wings with the cell crossed by two central, waved, black lines, which are continued to near submedian nervure, and two short contiguous black lines near apex; a discal oblique white fascia (continuous to the series of spots on anterior wings), narrowing towards anal angle and margined on each side with fuscous; this is followed by a series of fuscous lunulate spots, inwardly margined with whitish; a submarginal line as on anterior wings, but preceded by some obscure fuscous lunulate spots; margins of both wings narrowly fuscous, with the fringe greyish; abdominal margin greyish. Wings beneath pale ochraceous; anterior wings marked as above, but much paler; posterior wings marked generally as above, but much paler, the central series of fuscous lunulate spots almost obsolete, and with two fuscous lines between the bases of costal and subcostal nervures. Body and legs more or less concolorous with wings.

Female. Wings above as in male, but broader, and with the discal series of white spots much attenuated, the submarginal line extending to apex, which is not white, and with the white spot absent from cell. Posterior wings as in male, but with the central white fascia very narrow, and its following fuscous spots not margined with white. Wings beneath much paler than above, and with the markings bearing the same relation to those of the upper surface as obtains in the male.

Exp. wings, ♂ 52 millim.; ♀ 56 to 58 millim.

JUNE 30, 1883.

HAB.—Malay Peninsula ; Malacca (coll. Gosse ; Pinwill—Brit. Mus.)—Sumatra (Brit. Mus.)—Banca.\*—Java (Horsfield).—Borneo (Druce).

I have neither received nor seen specimens of this species from Province Wellesley or Penang. A male specimen collected by the Rev. L. Biggs in Malacca is represented by Figure 10; and a Malaccan female specimen collected by Capt. Pinwill is the original of Figure 11.

All the specimens of *L. alankara*, Horsf., which I could examine, having proved of the male sex, whilst those of *L. martha*, Fabr., have been invariably females, I have felt no hesitation in considering them as but the sexes of one species, and treating them here as such.

### Genus PANDITA.

*Pandita*, Moore (Horsf. & Moore), Cat. Lep. Mus. E.I.C. i. p. 181 (1857).

Anterior wings subtriangular, the costal margin obliquely suberect at base and then obliquely convex to apex, which is subprominent and broadly rounded; outer margin waved and sinuously and slightly concave about centre; inner margin moderately concave about centre, the outer and inner margins subequal in length. First and second subcostal nervules emitted before the end of cell, the first about one-third from and the second near its apex, third emitted rather less than half-way between cell and apex of wing; fourth and fifth bifurcating about half-way between base of the third and apex; second and third more or less suddenly amplified and rounded; the fourth angularly bent near base. Upper disco-cellular nervule very short and oblique, the middle obliquely concave, the lower suberect and subobsolete, indistinctly closing cell: these nervules emitted at about one-third from base of wing; median nervules generally as in preceding genus. Posterior wings obscurely subquadrate; the costal margin nearly straight at base and then suddenly deflexed, and becoming slightly convex towards apex; outer margin rounded and waved; abdominal margin much as in preceding genus. Costal nervure strongly arched and very convex near base. Subcostal nervules emitted at about the same distance from each other as the first is from base of subcostal nervure; lower disco-cellular nervule obsolete. Antennæ very gradually incrassated towards apex. Palpi much as in preceding genus.

About three species of *Pandita* are at present known,† and the area of the genus is apparently confined to the Indo-Malayan region.

#### 1. *Pandita sinope*. (Tab. XII., fig. 13 ♀.)

*Pandita Sinope*, Moore (Horsf. & Moore), Cat. Lep. Mus. E.I.C. i. p. 182, n. 371, t. 6a, f. 3 (1857); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 542, n. 1 (1877).

Male and Female. Wings above reddish ochraceous, with rather less than their basal halves darker, outwardly margined with a narrow fuscous fascia, which, commencing near costa of anterior wings, is obliquely directed outwardly beyond cell, and at median nervure is reflexed and directed inwardly to third median nervule of posterior wings, when it is again narrowly reflexed towards anal angle; between this and outer margins of both wings is a somewhat broader fuscous fascia, on anterior wings following somewhat the direction of the other fascia, but on posterior wings distinctly rounded and outwardly convex; two narrow submarginal fuscous fasciæ, the inner one on posterior wings very broad, and the

\* Collected by M. Teysmann (Pet. Nouv. Ent. vi. p. 404 (1874).

† The third species has lately been acquired by the British Museum from Nias Island, and is now being described.



outer margins broadly fuscous; anterior wings with the cell crossed by five fuscous lines, situate two near base, two near centre (between which the colour is pale), and one convexly waved at apex, beyond which is a straighter and more obscure line; beneath the cell and between the third median nervule and submedian nervure are two circular fuscous lines in shape of the figure 8, and a short basal line of the same colour; beneath the apex of cell is an oblique fuscous fascia; posterior wings with the cell crossed by four fuscous lines which are partly united, the posterior one preceded by some lunulate fuscous markings, and beneath the median nervure are some very indistinct fuscous lines. Abdominal margin obscure violaceous. Wings beneath paler than above; posterior wings with the abdominal area greenish or violaceous, and with a waved series of fuscous linear markings outwardly surrounding cell. Body and legs more or less concolorous with wings.

Exp. wings, 50 to 54 millim.

HAB.—Malay Peninsula; Penang (Brit. Mus.); Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (coll. Hewits.)—Banca.\*—Java (Horsf.).

### Genus LIMENITIS.

*Limenitis*, Fabricius, Ill. Mag. vi. p. 281 (1807); Westw. Gen. Diurn. Lep. p. 274 (1850); Feld. Neues Lep. p. 29 (1861).

*Callianira*, Hübn. Verz. bek. Schmett. p. 38 (1816).

*Nymphalis*, Boisd. (nec Latr.), Ind. Méth. p. 14 (1829); Gen. Ind. Méth. p. 16 (1840); Boisd. & Lec. Lep. Amer. Sept. p. 197 (1833).

*Moduza*, Moore, Lep. Ceyl. i. p. 47 (1881).

Anterior wings subtriangular; costal margin strongly arched and convex; apical angle generally more or less produced and rounded; outer margin generally more or less waved and concavely excavated; inner margin nearly straight or more or less concave near centre. First and second subcostal nervules emitted before end of cell and from about its outer third; third subcostal nervule emitted between end of cell and apex of wing; fourth and fifth bifurcating about midway between base of third and the outer margin; the second and third more or less suddenly amplified and rounded, the fourth slightly angulated and bent near base; discoidal nervules emitted considerably beyond basal third of wing, the lower nervule somewhat rudimentary or obsolete; submedian nervules somewhat wide apart, the first rounded at base. Posterior wings subovate, the costal margin strongly arched at base and then oblique and very slightly convex to apex; outer margin more or less waved and rounded; abdominal margin as in preceding genera; subcostal nervules bifurcating much as in preceding genus; the third median and first subcostal nervules about subequal in length. Antennæ moderately long, with an elongate and gradually formed club. Palpi robust, porrect, hairy, not raised above the upper level of the eyes.

This is a genus of considerable extent and wide distribution, being almost confined, however, to the Northern Hemisphere, and common to Europe, Asia, and America. It is perhaps in North-Eastern India that species of *Limenitis* reach their maximum in size and coloration, and the genus from thence extends throughout a considerable portion of the Malayan Archipelago, being very well represented in the Celebes.

We are acquainted with the transformations of several species of *Limenitis*, including those of the only species found in this fauna, to which due reference is made.

\* Collected by M. Teysmann (Pet. Nouv. Ent. vi. p. 404 (1874)).

1. *Limenitis procris*. (Tab. XVII., fig. 1 ♂.)

*Papilio Procris*, Cramer, Pap. Ex. ii. t. 106, E F (1779).

*Nymphalis Procris*, Godt. Enc. Méth. ix. p. 404, n. 178 (1823).

*Biblis Procris*, Horsf. Cat. Lep. E.I.C. t. viii. f. 4 (1829).

*Limenitis Procris*, Horsf. & Moore, Cat. Lep. Mus. E.I.C. i. p. 179, n. 362 (1857); Druce, Proc. Zool. Soc. 1873, p. 343, n. 1; Butl. Trans. Linn. Soc. ser. 2. Zool. vol. i. p. 541, n. 1.

Var. *Limenitis anarta*, Moore, Proc. Zool. Soc. 1877, p. 585.

*Limenitis procris*, var. *anarta*, Wood-Mas. & de Nic. Journ. Asiat. Soc. Beng. vol. xlix. p. 229, n. 33 (1880).

Male and Female. Wings above bright ferruginous. Anterior wings with the cell crossed by three black lines, and with the same number between the third median nervule and the submedian nervule; beyond cell the whole disk of the wing is triangularly blackish, containing an oblique series of five white spots, situate one at end of cell, three separated by the median nervules, the fifth and smallest on inner margin; four or five subapical white spots, of which two linear and smallest are subcostal (one only on specimen figured), two, largest, separated by upper discoidal nervule, and one very small beneath the lower discoidal nervule; a broad submarginal waved black fascia and two narrower marginal fasciæ of the same colour, which sometimes become fused as in the specimen figured. Posterior wings with the cell crossed by two pairs of blackish lines and with a few small black markings above cell; a broad central oblique white macular fascia continuous to the central spots of anterior wings, terminating at submedian nervule, its inner margin somewhat regular and narrowly bordered with black, its outer margin scalloped and broadly margined with black; this is followed by a series of blackish spots placed between the nervules and marginal and submarginal fasciæ, much as on anterior wings, but the inner one terminating at anal angle in two small spots. Wings beneath with the white markings as above; anterior wings with the basal area before the white spots (which are margined with black), very pale olivaceous; the third and fourth lines in cell including a bright reddish spot, and the same beneath cell; the black discal area above reddish beneath, the three lower subapical white spots being situate in long and somewhat linear black spots; submarginal black fascia very much broken and subobsolete; marginal fasciæ as above; marginal area pale violaceous. Posterior wings with the whole basal area to just beyond the white fascia, very pale olivaceous; marginal and submarginal fasciæ as on anterior wings, but the last more obsolete and only denoted by a series of spots. Body and legs more or less concolorous with wings.

Exp. wings, ♂ 58 to 68 millim.; ♀ (one spec.), 72 millim.

HAB.—Continental India; Silhet (Brit. Mus.); Darjeeling (coll. Dist.)—Andaman Islands (Moore).—Malay Peninsula; Penang, Province Wellesley (coll. Dist. & Saüer); Malacca (Pinwill—Brit. Mus.)—Sumatra (Forbes—coll. Dist.)—Banca.\*—Java (Brit. Mus.)—Borneo (coll. Godm. & Salv.); Sandakan (Pryer—coll. Dist.).

The Andaman form described by Mr. Moore under the name of *L. anarta*,† which I have followed Messrs. Wood-Mason and de Nicéville in considering a variety of the species, appears to constantly differ by the smallness or absence of the white spot at the end of the cell of anterior wings.

The larva and pupa as found in Java are figured by Horsfield,‡ who describes the first as feeding “on a species of *Nauclea* bearing the native name of *Kleppu*.”§

\* Collected by M. Teysmann (Pet. Nouv. Ent. vi. p. 404 (1874).

† Proc. Zool. Soc. 1877, p. 585.

‡ Cat. Lep. E.I.C. t. viii. f. 4, 4a.

§ Horsf. & Moore, Cat. Lep. Mus. E.I.C. i. p. 179.

## Genus NEPTIS.

- Neptis*, Fabricius, Ill. Mag. vi. p. 282 (1807); Westw. Gen. Diurn. Lep. p. 270 (1850); Moore, Proc. Zool. Soc. 1858, p. 3; Lep. Ceyl. i. p. 54 (1881).  
*Acca* (part), Hübn. Verz. bek. Schmett. p. 44 (1816).  
*Philonoma*, Billb. Enum. Ins. p. 78 (1820).  
*Phadyma*, Feld. Neues. Lep. p. 31 (1861).  
*Rahinda*, Moore, Lep. Ceyl. i. p. 56 (1881).

Anterior wings subtriangular, the costal margin arched and convex from base; apical angle rounded; outer margin generally convexly rounded, sometimes concavely sinuate about centre, and frequently waved; inner margin convexly produced near base, and more or less concavely sinuated beyond centre. Subcostal nervules variable; in the majority and most typical of the species\* the first and second subcostal nervules are emitted before and near the end of the cell, the third at less than midway between the extremity of the cell and apex of wing, and the fourth and fifth bifurcate at a less distance from base of third than from apex; other species† have the second subcostal nervule emitted at the extremity of the cell; and some‡ again have the first emitted near end of cell and the second between end of cell and base of third nervule; lower disco-cellular nervule obsolete. Posterior wings subovate; costal margin convex and arched at immediate base and then nearly straight along its greatest length, deflexed and slightly rounded towards apex; outer margin rounded and often waved; abdominal margin oblique at anal angle; costal nervure more or less arched and convex, but not reaching apex of wing. Palpi hairy, porrect, and with the apices acutely pointed. Antennæ slender, with a gradually formed club.

The above are the principal characteristics of this variable genus, and I should naturally have followed Mr. Moore, and used his proposed genus *Rahinda* for the small group of tawny species forming the *hordonia* group, had I not found that the strongly divergent character of the position of the second subcostal nervule, § as found in *N. hordonia*, did not apply to all the other species of the same similarly coloured and sized group. ||

*Neptis* is a very large genus, and is found in the warmer portions of the Old World. Two species inhabit portions of Eastern and South-Eastern Europe, and the genus is represented in Western, Southern and Eastern Africa, Madagascar, and Mauritius. It is very abundant in Continental India, and extends eastward throughout the Malayan Archipelago; it is found as far north as Japan and as far south as Australia.

Several transformations have been figured and described. The larva and pupa of a Javan species are figured by Horsfield, ¶ who elsewhere states that the larva “feeds on a species of *Hedysarum* bearing the native name of Kajangan”;\*\* and we are indebted to the Bros. de Alwis for the drawings of the transformations of two species found in Ceylon (*N. varmona* and *N. jumba*). ††

\* As *Neptis duryodana*.

† As *Neptis tiga*.

‡ As *Neptis hordonia*.

§ A character which I have already used in separating my genus *Chersonesia* from *Cyrestis*.

|| Mr. Salvin has recently drawn my attention to similar, and even stronger, structural peculiarities in the Tropical American genus *Ageronia*.

¶ Cat. Lep. E.I.C. t. vii. f. 9 and 9a.

\*\* Cat. Lep. Mus. E.I.C. i. p. 169.

†† Moore's Lep. Ceyl. i. pp. 55 and 56, t. 28, f. 1b and 2b.

A. *Wings with orange-coloured markings and spots.*a. *Second subcostal nervule of anterior wings emitted at some distance from end of cell.* RAHINDA, Moore.1. *Neptis hordonia.* (Tab. XVII., fig. 13 ♂.)*Papilio Hordonia*, Stoll, Suppl. Cram. t. 33, f. 4, 4 D (1790).*Nymphalis Hordonia*, Godt. Enc. Méth. ix. p. 429, n. 253 (1823).*Neptis Hordonia*, Horsf. & Moore, Cat. Lep. Mus. E.I.C. i. p. 164, n. 337 (1857); Druce, Proc. Zool. Soc. 1873, p. 343, n. 1; *ibid.* 1874, p. 105, n. 3; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 542, n. 11 (1877).

Male and Female. Wings above rich dark brown, with the following orange-coloured markings:—Anterior wings with a long and broad basal cellular streak occupying the lower half of cell and deflexed and extending beyond it at and above the first and second median nervules, this streak above is distinctly cleft a little beyond its centre, and in some specimens extends a little beneath the median nervule; a subapical transverse macular fascia, commencing near costa and terminating near first median nervule, and a short oblique curved and dentate fascia, commencing above the second median nervule and terminating on inner margin; posterior wings with a broad central fascia and a narrow (in some specimens broad) curved submarginal one. Both wings with a narrow fuscous submarginal fascia, sometimes that on anterior wings and sometimes those on both wings narrowly outwardly margined with dark ochraceous. Wings beneath ochraceous; anterior wings with a broad costal streak extending to beyond cell, and from thence deflexed and outwardly curved to beyond third median nervule, reddish brown; two waved reddish brown submarginal fasciæ, and the margin broadly of the same colour, between these the colour is more or less violaceous; extreme margin fuscous, the fringe alternately greyish; posterior wings with a broad basal reddish brown fascia or suffusion; a somewhat curved central violaceous fascia, narrowly bordered anteriorly and broadly posteriorly with reddish brown, and a submarginal fascia somewhat similarly coloured and bordered. Body and legs more or less concolorous with the ground colour of the wings both above and beneath.

Exp. wings, ♂ and ♀, 42 to 45 millim.

HAB.—Continental India; Bombay (Dr. Leith); Darjeeling (coll. Dist.)—Malay Peninsula; Malacca (Pinwill—Brit. Mus.)—Sunatra (Forbes, coll. Dist.)—Banca.\*—Java (Horsf. & Moore).—Borneo (Druce).—Siam; Chentaboon (Druce).

This is a protean species, and varies much both in markings and hue, points of some importance in estimating the specific position of other and closely allied variable species. The specimen here figured agrees with the figure of Stoll, and may be considered as typical. Other Malaccan specimens in the British Museum have the yellow submarginal fascia on the upper surface of the posterior wings much wider, but are still inconstant in that respect. The palest specimen I possess, with all the yellow markings broadest, is from Bombay. The mottled markings beneath are always present and always distinctive.

2. *Neptis peraka.* (Tab. XVII., fig. 2 ♀.)*Neptis peraka*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 542, n. 9, t. lxxviii. fig. 2 (1877).

Male and Female. Closely allied to the preceding species (*N. hordonia*), and above scarcely distinguishable from some of the broadly yellow marked varieties of that species. The wings beneath are

\* Collected by M. Teysmann (Pet. Nouv. Ent. 1874, p. 404).

not mottled, and though the pattern of the anterior wings is similar, the markings of the posterior wings are distinct, which consist of a basal fascia with dark margins; a regular and similarly coloured and margined fascia near centre, and a somewhat similar marginal fascia.

Exp. wings, ♂ and ♀, 40 to 46 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Brit. Mus. and coll. Moore).—Borneo; Sandakan (Pryer—coll. Dist.).

The few North Bornean examples I possess only differ from Malaccan specimens by the smaller subapical yellow fascia to the anterior wings, and could a long series from both localities be examined that variation would doubtless be found to pervade the species in both areas.

### 3. *Neptis dindinga*. (Tab. XVII., fig. 5 ♀.)

*Neptis dindinga*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 542, n. 10, t. lxxviii. fig. 6 (1877).

Female. This species is allied to the preceding (*N. peraka*), from which it differs by the different shape of the cellular streak and the absence of the yellow submarginal lines to the anterior wings; the yellow fasciæ to posterior wings are much broader (but this we have already seen is a variable character); the markings on the under surface of the wings are darker, larger, and more regular, especially on the anterior wings.

Exp. wings, 48 to 50 millim.

HAB.—Burma; Moulmein (Brit. Mus.)—Tenasserim (Brit. Mus.)—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).

I only know this species from the specimens contained in the British Museum, one of which from Malacca is here figured.

aa. *Second subcostal nervule of anterior wings emitted at extremity of cell.*

### 4. *Neptis tiga*. (Tab. XVII., fig. 4 ♂.)

*Neptis Tiga*, Moore, Proc. Zool. Soc. 1858, p. 4, n. 3; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 542, n. 8 (1877).

Male and Female. Wings above rich dark brown, with the following orange-coloured markings:—Anterior wings with a large cellular streak much resembling that of *N. dindinga*, but sometimes more or less truncate at its apex, as in the specimen figured; this is followed by a subapical transverse streak and two irregularly shaped spots, situate one on the area of the median nervules and one on the inner margin; a broad submarginal fascia, strongly sinuated and toothed interiorly, followed by a submarginal line of the same colour. Posterior wings crossed by two broad fasciæ, one near base and the other near outer margin, and a submarginal line of the same colour. Wings beneath ochraceous, the anterior wings with a broad subcostal pale fuscous fascia, which is obliquely deflexed beyond cell, and forms a large looped spot extending from costa to first median nervule; a pale fuscous fascia beneath cell, which forms an irregularly looped spot beneath and attached to the other looped spot, and which outwardly extends to inner margin; a pale fuscous submarginal line and the outer margin broadly of the same colour; posterior wings marked as above, but the colour much paler and the dark portions much narrower. Body above rich dark brown,

the thorax with some frontal yellow markings and the disk of the abdomen beyond base much suffused with the same colour; body beneath and legs more or less concolorous with wings.

Exp. wings, 45 to 48 millim.

*Var. dorelia.* (Tab. XVII., fig. 3.)

*Neptis dorelia*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 542, n. 7, t. lxxviii. f. 3 (1877).

*Papilio heliodore*, Fabr. (nec. Cram. nec. Moore), Mant. Ins. ii. p. 52, n. 516 (1787); Ent. Syst. iii. p. 130, n. 401 (1793).

*Neptis Heliodore*, Butl. Cat. Fabr. Lep. p. 62, n. 4 (1869).

*Neptis heliodora*, Druce, Proc. Zool. Soc. 1873, p. 343, n. 2.

Mr. Butler states as his "defferentia specifica" that "the type of the Fabrician species differs from the examples of *N. tiga* in the Horsfield Cabinet from Java in having a single instead of a double central arched line across the under surface of the secondaries; this line is, in some examples, slightly thickened."

HAB.—Burma; Moulmein (Brit. Mus.)—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.)—Java (coll. Horsf.)—Borneo (Druce).—Siam (Moore).

A Malaccan specimen in the British Museum, which was collected by Capt. Pinwill, is represented by the figure 4 (Tab. XVII.), which is a slight variety compared with the type, though I possess a thoroughly typical specimen collected in Province Wellesley.

B. *Wings with pale fuliginous markings and spots.*

5. *Neptis vikasi.* (Tab. XVI., fig. 13 ♀.)

*Neptis Vikasi*, Horsfield, Cat. Lep. E.I.C. t. 5, f. 2, 2a (1829); Horsf. & Moore, Cat. Lep. Mus. E.I.C. i. p. 165, n. 340 (1857); Druce, Proc. Zool. Soc. 1873, p. 344, n. 4; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541, n. 5 (1877).

*Var. Neptis Omeroda*, Moore, Proc. Zool. Soc. 1874, p. 571.

Male and Female. Wings above dark shining fuliginous-brown, with paler and darker markings. Anterior wings with the following very pale fuliginous markings:—a long basal cellular streak about reaching the lower discoidal nervule, beyond which the wing is crossed by a strongly curved series of spots, and two almost straight submarginal fasciæ, which are denoted and separated by two very dark fuscous and abruptly sinuated narrow fasciæ, the outer margin with a distinctly darker patch near apex and about centre. Posterior wings with an almost straight, transverse, and very pale fuliginous fascia near base, followed shortly beyond by a narrow and obscurely paler linear fascia, and a very dark fuscous macular fascia crossing centre of wing; a submarginal series of very dark fuscous spots placed between the nervules, preceded and followed by pale fuliginous, the outer margin being broadly fuscous and very obscurely spotted. Wings beneath very much paler, marked generally as above, but the pale markings nearly white and the spots on the outer margins of both wings very distinct. Body and legs more or less concolorous with wings.

Exp. wings, 52 to 55 millim.

HAB.—Continental India; Darjeeling; Sikkim.\*—Malay Peninsula; Penang (Mus. Hop. Oxon.)—Province Wellesley (coll. Dist.)—Malacca (Pinwill—Brit. Mus.)—Java (Horsf.)—Borneo (Druce, and coll. Dist.)—Celebes (van Hasselt—coll. Dist.).

The chromo-lithographic artist has not been happy with the figure of a specimen from Province Wellesley, which is here given. In this figure the colour of the under surface of the

\* De Nicéville (Journ. As. Soc. Beng. vol. li. part 2, p. 59, n. 155.

wings is too ferruginous, and not sufficiently olivaceous, whilst the basal whitish fascia to the posterior wings is not sufficiently broad. In fact this specimen agrees well with Horsfield's figure, save that it is rather browner in hue above, and the contrary has been relied upon by Mr. Moore in separating his *N. omeroda*, "allied to *N. vikasi*, but is a much blacker insect both above and below."\* I cannot, however, believe that Penang † possesses a different species to the widely ranging one found in Province Wellesley; and a drawing of *N. omeroda* kindly made for me by Prof. Westwood has, in my mind, confirmed this view.

C. *Wings with whitish spots and markings.* •

6. *Neptis ophiana*. (Tab. XVII., fig. 12.)

*Neptis ophiana*, Moore, Proc. Zool. Soc. 1872, p. 561.

*Neptis columella*, Moore (part), Proc. Zool. Soc. 1858, p. 7, n. 13; Butl. (nec. Cram.), Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 542, n. 6 (1877).

Male and Female. Wings above dark fuscous, with the following greenish white spots and markings:—Anterior wings with a cellular streak gradually widening to apex, which is truncate (sometimes somewhat cleft near its apex, or entire, as in the Malaccan specimen figured); this is followed by a large and subtriangular spot at the end of cell, beyond which are two large and irregularly ovate spots placed one on each side of the upper discoidal nervule (sometimes preceded by a very small spot near costa), and beneath which are two spots placed one on each side of the second median nervule; a large elongate spot on inner margin, sometimes preceded by a small spot above submedian nervule; a submarginal series of four small spots, three near apex and one between the second and third median nervules (the upper three being sometimes preceded by a small obscure spot near costa); posterior wing with a broad transverse fascia near base, not extending above the lower subcostal nervule, and an outer discal series of spots placed between the nervules. On each side of the submarginal spots on anterior wings are two narrow obscure dark fasciæ, sometimes followed by some paler markings; the posterior wings possess a distinct narrow submarginal fuliginous fascia. Wings beneath more or less reddish ochraceous; anterior wings with the pale spots as above, but the submarginal spots continuous and preceded and followed by white markings; posterior wings with a distinct greyish fascia commencing at base, but not reaching apex; other pale markings as above, but the outer discal spots much larger, and followed by a double series of linear white spots; between the transverse fascia and the outer discal spots is a transverse obscurely greyish line. Body above fuscous, beneath greyish; the femora greyish; the tibiæ and tarsi pale ochraceous.

Exp. wings, 65 millim.

HAB.—Continental India; Darjeeling (coll. Moore).—Malay Peninsula; Malacca (coll. Moore.—Pinwill; Brit. Mus.).

Malaccan specimens agree thoroughly with the type of the species (which, by the kindness of Mr. Moore, is now before me), save that the discal spots are somewhat larger, and, as in the specimen figured, † the basal streak is entire, though in other specimens from the same locality it is abbreviated and somewhat cleft. It appears to be sufficiently distinct, however, from

\* Proc. Zool. Soc. 1874, p. 571.

† Penang is the habitat given, but, as is so often the case with insects thus labelled, Province Wellesley may probably be its true locality.

‡ Collected by Capt. Pinwill in Malacca.

*N. columella*, which was described by Cramer as from China, and as figured is a much larger insect, with a *concave* spot on the inner margin of the anterior wings.

In two specimens now before me, *viz.*, the "type" from Darjeeling and a Malaccan example, the neuration of the posterior wings is aberrant, the costal nervure being placed low down and reaching the apex, whilst the subcostal nervules are thus forced close together.

7. *Neptis nata*. (Tab. XVIII., fig. 1.)

*Neptis Nata*, Moore (Horsf. & Moore), Cat. Lep. Mns. E.I.C. i. p. 168, n. 346, t. 4a, f. 6 (1857); Proc. Zool. Soc. 1858, p. 10, n. 22; Druce, Proc. Zool. Soc. 1873, p. 343, n. 3; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541, n. 4 (1877).

Not having received either this or the two following species I have thought it best in each case to give the original description of its describer, having also figured Malaccan specimens collected by Capt. Pinwill, and contained in the British Museum.

"Upper side deep black; markings very white: *fore wing* with the discoidal streak long, in two portions; curved series of spots small: *hind wing* with the bands narrow. Under side dusky brown; inner band of hind wing not extending to anterior margin; a marginal line *only* between outer band and exterior margin, the submarginal line being obsolete. Sexes alike."

"Expanse  $2\frac{2}{3}$  inches."

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.); Singapore (Moore).—Borneo (Moore—Druce).

8. *Neptis leuconata*. (Tab. XVII., fig. 14.)

*Neptis leuconata*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541, n. 2, t. lxxix. fig. 1 (1877).

The following is Mr. Butler's description:—

"Wings above olive-brown, banded and spotted with cream-colour; arrangements of markings as in *N. nata*, but the bands of secondaries wider and nearer together; pale brown intermediate streaks better defined. Wings below slightly redder; bands and spots as above; intermediate streaks white."

"Exp. wings, 2 inches."

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).

The figure is taken from one of Capt. Pinwill's captures, but I have not as yet received the species from Province Wellesley.

9. *Neptis gononata*. (Tab. XVIII., fig. 2 ♂.)

*Neptis gononata*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541, n. 3, t. lxxix. fig. 2 (1877).

This species is very closely allied to the N.E. Indian *N. soma*, Moore, of which it is an undoubted local race, and is described by Mr. Butler as follows:—

"Wings of the same shape and with the same spots and bands as *N. soma*; but all these markings pure white instead of sordid yellowish white. Wings below chocolate-brown; bands below straighter; submarginal line of secondaries below white."

"Exp. wings, 2 inches 1 line."

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).

The figure is taken from the typical specimen in the National Collection.



10. *Neptis duryodana*, var. (Tab. XVI., fig. 15 ♀.)

*Neptis Duryodana*, Moore, Proc. Zool. Soc. 1858, p. 10, n. 21, t. 49, f. 8.

Female. Wings above dark fuscous. Anterior wings with the following white spots and markings:—a long basal cellular streak gradually widening and terminating about apex of cell; this is followed by a long subtriangular spot placed between the lower discoidal and the first median nervules; two large subapical spots placed obliquely, divided by the upper discoidal nervule and preceded by two very small subcostal spots; two rounded discal spots divided by the second median nervule; two smaller spots on inner margin divided by the submedian nervule and a submarginal series of small spots directed obliquely inward at apex, which are outwardly and inwardly margined with black; fringe alternately white. Posterior wings with the following white markings:—a nearly straight transverse fascia near base and a series of small subquadrate spots on outer third of wing, which are divided by the nervules, with the innermost obliquely deflexed towards anal angle; between these transverse white markings is a very narrow pale fascia, and there is also a narrower and greyish submarginal one;\* fringe alternately white. Wings beneath much paler and more or less olivaceous; white markings as above, but larger; on anterior wings the submarginal series of spots are preceded and followed by grey lines, the inner one very strongly waved; the posterior wings have the basal costal margin white, an additional subbasal narrow whitish fascia, the narrow discal intermediate fascia much paler and the submarginal one nearly white. Body above fuscous, beneath greyish; legs greyish, the intermediate and posterior tibiæ and tarsi brownish.

Exp. wings, ♀ 54 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.)—Borneo (Brit. Mus.).

I have compared the female specimen here figured and described with the Bornean type in the British Museum, and find the following slight varietal differences:—On the underside of the anterior wings the cellular streak is not so strongly divided from the adjacent and following spot; the broad white fascia on the posterior wings reaches the costal margin, † and the colour beneath is also darker, but this is an inconstant character.

11. *Neptis charon*.

*Neptis Charon*, Butler, Ann. Nat. Hist. ser. 3, vol. xx. p. 400, t. 9, f. 1 (1867).

At present my whole knowledge of this species is represented by Mr. Butler's figure and description, both of which are here reproduced.

“Alæ supra nigerrimæ: anticæ stria triangulari discoidali, macula contigua cuneata, maculis tribus subapicalibus inæqualibus, tribus subanalibus oblique positis punctisque octo submarginalibus niveis; punctis octo marginalibus striaque valde indistincta irregulari discali subcinereis: posticæ fascia subbasali et altera septem-maculari discali niveis; stria submarginali maculari subcinerea, fascia media fuscescente indistincta: corpus nigrum, virescens; antennis nigris, flavo acuminatis.”

“Alæ subtus pallidiores, striis discali anticarum et media posticarum violaceis, stria submarginali canescente; stria marginali cinerea;



FIG. 43.—*Neptis charon*. ‡

\* In the figure here given this submarginal fascia is not sufficiently pale in line.

† In another Malaccan specimen in the British Museum this fascia does not extend to the costal margin, thus agreeing with the typical form of the species.

‡ Sex not stated, but, from appearance of figure, probably female.

costa basali posticarum nivea: aliter velut supra: corpus caruleo-albidum: pedibus ochreis: antennis ferrugineis."

"Exp. alar. unc.  $2\frac{1}{2}$ ."

Hab.—Malay Peninsula: "Singapore coll. Robertis."

This is evidently closely allied to the preceding species.

12. *Neptis eurynome*, var. *mamaja*. (Tab. XVI., fig. 14 ♀.)

*Neptis eurynome*, Westwood, Den. Ins. China, p. 66, t. 35, fig. 4 (1842).

*Neptis mamaja*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. 1, p. 541, n. 1, t. lxix, fig. 3 (1877).

Male and Female. Wings above closely resembling the preceding species *N. dergodoni*, but the pale markings more or less tinged with lemon-colour (very strongly so in the specimen figured), the spot at the end of the cell on anterior wings smaller, but variable in size, and the narrow pale submarginal linear fascia to posterior wings almost obsolete. Wings beneath warm ochraceous: markings resembling those of *N. dergodoni*, but more or less tinged with lemon-colour as above, and with the outer pale discal fascia to the posterior wings more macular than in that species.

Exp. wings, ♂ and ♀, 50 to 57 millim.

Hab.\*—Malay Peninsula: Province Wellesley (coll. Dist. and Sauer): Malacca (Pinwill—Brit. Mus.).

Typical specimens of *N. eurynome*, localised as from N. India (sic) and China, which I have examined, appear to be sufficiently distinct from the European *N. aegeris*, Lep., to have specific differentiation, though I consider the *N. mamaja*, Butl., to be better expressed as a variety only of Prof. Westwood's species,<sup>†</sup> especially as I have received another very close variety from North Borneo. Even in my Province Wellesley specimens considerable variation is found, such as the basal cellular streak of the anterior wings being either broken, or entire as in the figure here given.

### Genus ATHYMA.

*Athyma*, Westwood, Gen. Diarn. Lep. p. 272 (1850): Fald. Nees Lepid. p. 31, n. 75 (1861).

This genus is allied to *Neptis*, from which it differs, as clearly pointed out by Prof. Westwood, in having its species of a "larger size, more robust structure, with larger and shorter wings, more squamose and obtuse palpi," and especially (as pointed out in the synopsis here given) by the costal nervure of the posterior wings extending to their apex. The anterior wings have the costal nervure robust, extending to about half the length of the costa: first and second subcostal nervules emitted before the end of cell, the first at about two-thirds of its length, and the second a little before its apex, the third arising between end of cell and apex of wing, but nearer to the first than to the last: fourth and fifth bifurcating between the base of third and apex of wing. Lower disco-cellular nervule either more or less obsolete and leaving the cell practically open, § or present and distinct, though very slender, and suberect, thus closing cell.

This, like *Neptis*, is another extensive genus, but with a more restricted geographical distribution. Thus it is absent from Europe, and also apparently from the Ethiopian region.

\* Of var. *mamaja* only.

† Mr. Butler's description is "Nearly allied to *N. eurynome*, but always to be distinguished by the narrow wet external band of white spots in secondaries: colouring below rather brighter than in *N. eurynome*."

§ Of the *dergodoni* group.

‡ As in *A. perus*.

¶ As in *A. nefte*.

From Continental India it is distributed through the Malay Peninsula and onwards through the Malayan Archipelago to Papua, extending as far north as China. Though found in the Andaman Islands it is apparently absent from Ceylon.

The larva and pupa of *A. perius*, as found in Java, have been figured by Horsfield,\* which show that though *Neptis* and *Athyma* are closely allied in their perfect condition, they are yet considerably divergent in larval characters, thus again exemplifying the artificiality of the present system of classification.

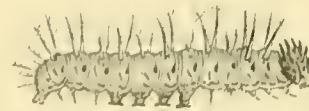


FIG. 44.—Larva of *Athyma perius*.  
From Horsfield's Cat. Lep. E.I.C.

We know scarcely anything of the life-histories of the species comprising this genus, though several points require elucidation to settle some speculative opinion. Thus the genus is supposed to be of a protected nature, owing to the fact of it being apparently "mimicked" by species of other genera. A most notable instance of this is afforded by the *Apatura chevana*, Moore, a Darjeeling species, which, though possessing the beautiful coloration of that genus beneath, is marked above like a species of *Athyma*. This, however, on examination, appears to be a case of "spurious mimicry," † as the insect when at rest, with its wings folded (and we are not told it is aberrant in this respect), would exhibit the *Apaturan* distinctiveness, and thus be afforded no protection by the *Athymal* simulation of their upper surface; and even as regards this, Mr. Moore adds to his description, ‡ "Mr. W. S. Atkinson has informed me that in fresh-captured specimens the upper side has also the beautiful reflected purple gloss visible in that insect."

Such facts tend to confirm the bias of my opinion, expressed before (*ante*, p. 33), that casual resemblance, without supporting facts, does not conform to the theory of "mimicry," as originally, and philosophically, formulated. Prof. W. T. Thiselton Dyer has recently, and opportunely, observed that "the biological sciences not having reached the deductive stage, it is not possible to enlarge our knowledge of them by mere ratiocination." §

A. Lower disco-cellular nervule of anterior wings obsolete or subobsolete, leaving the cell apparently open.  
a. Sexes alike or similar in colour and markings.

### 1. *Athyma perius*. (Tab. XVI., fig. 2 ♂.)

*Papilio Perius*, Linnaeus, Syst. Nat. ed. x. p. 471, n. 79 (1758); *ibid.* ed. xii. p. 766, n. 116 (1767); Houtt. Naturl. Hist. i. 11, p. 268, n. 79 (1767); Müll. Naturs. v. 1, p. 596, n. 116 (1771); Gmel. Syst. Nat. i. 5, p. 2278, n. 116 (1790).

*Papilio Leucothoë*, Linn. Syst. Nat. ed. x. p. 478, n. 122 (1758); Mus. Lud. Ulr. p. 292, n. 110 (1764); Syst. Nat. ed. xii. p. 780, n. 179 (1767); Clerck, Icones Ins. iii. (inedit.), t. 5, f. 4 (1764); Houtt. Naturl. Hist. i. 11. p. 330, n. 122 (1767); Müll. Naturs. v. 1, p. 612, n. 179 (1774); Fabr. Syst. Ent. p. 508, n. 272 (1775); Mant. Ins. ii. p. 52, n. 511 (1787); Ent. Syst. iii. 1, p. 129, n. 395 (1793); Gmel.

\* Cat. Lep. E.I.C. t. viii. f. 3, 3a (under the name of *Biblis leucothoë*).

† Karl Semper, in the twelfth chapter of his 'Natural Conditions of Existence as they affect Animal Life,' has keenly discussed this point, with the thorough knowledge of a "special" and "travelled" naturalist. With a perfect acknowledgment of "mimicry," he has not followed a somewhat "easy" course of referring all resemblance to that explanation.

‡ Proc. Zool. Soc. 1865, p. 764.

§ 'Nature,' vol. xxviii. p. 171.

Syst. Nat. i. 5, p. 2318, n. 179 (1790); Thunb. Mus. Nat. Ups. xxiii. p. 9 (1804); Turt. Syst. of Nat. iii. 2, p. 107 (1806).

*Acca Leucothoë*, Hübn. Verz. bek. Schmett. p. 44, n. 397 (1816).

*Nymphalis Leucothoë*, Godt. Enc. Méth. ix. p. 430, n. 256 (1823).

*Limenitis Leucothoë*, Westw. Don. Ins. China, ed. 2, p. 65, t. 35, f. 3 (1842).

*Papilio Hylas*, Linn. Syst. Nat. ed. x. p. 486, n. 173 (1758); Houtt. Naturl. Hist. i. 11, p. 383, n. 173 (1767).

*Papilio erosine*, Cram. Pap. Exot. iii. t. 203, f. E, F (1779); Herbst, Naturs. Schmett. ix. p. 97, n. 20, t. 240, f. 5, 6 (1798).

*Najas Erosine*, Hübn. Samml. Exot. Schmett. i. t. 63 (1806-16).

*Papilio Leucotheca*, Fabr. Spec. Ins. ii. p. 96, n. 421 (1781).

*Papilio Polyxena*, Donovan. Ins. China, t. 37, f. 4 (1799).

*Athyma Leucothoë*, Horsf. & Moore (excl. Sulzer\*), Cat. Lep. Mus. E.I.C. i. p. 170, n. 349 (1857); Butl. Cat.

Fabr. Lep. p. 61, n. 1 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 540, n. 2 (1877).

*Athyma Perius*, Aurivillius, Kongl. sv. vet. Akad. Handl. Band. 19, pp. 68-9 (1882).

Male and Female. Wings above dark fuscous, with the following lemon-white spots and markings:— anterior wings with a basal streak and two spots in cell; a subtriangular spot at end of cell; two elongate subapical spots divided by the upper discoidal nervule, beneath which are an oblique discal series of five spots directed inwardly, the upper two smallest, and the fifth linear on inner margin; a submarginal series of six very small spots, the third, fourth and fifth contiguous to the upper three discal spots; posterior wings with a wide transverse macular fascia near base, and an outer discal series of six small spots, inwardly margined with dark fuscous spots, placed between the nervules; both wings with a waved pale linear submarginal fascia and the fringe alternately white. Wings beneath dark warm ochraceous; pale spots as above, but whiter and more or less margined with black. Anterior wings with four black spots beneath third median nervule, viz. two beneath cell (the basal very small), the largest before the fourth discal spot, and the last following this spot; posterior wings with the apex of precostal nervule black and situate in a basal transverse whitish fascia; central fascia as above, but more or less margined on each side with black, the outer discal spots above fused into a macular fascia beneath, and containing a series of small black spots placed between the nervules (two between the third median nervule and submedian nervule); both wings with a narrow pale waved submarginal violaceous fascia, outwardly margined with black; fringe as above. Body above dark fuscous, the eyes castaneous; thorax with some discal linear grey markings and two posterior oblique spots of the same colour; abdomen annulated with greyish. Body beneath and legs greyish, the under surfaces of the tarsi castaneous.

Exp. wings, ♂ and ♀, 60 to 66 millim.

HAB.—Continental India; Darjeeling; Assam (Horsf. & Moore); Landhaur; Nepaul; Cachar (Brit. Mus.); Bombay (Dr. Leith—coll. Dist.)—Malay Peninsula; Province Wellesley (colls. Dist. and Säuer); Malacca (Brit. Mus.)—Java (coll. Horsf.)—Siam; Chentaboon; Nabeonchaisee (Layard).—Formosa.—China (Brit. Mus.)

The larva and pupa of this species, as found in Java, † have been figured by Dr. Horsfield, ‡ who states that the first “feeds on a species of *Phyllanthus* bearing the native name of *Dempul-lolot*.” §

The late Mr. Swinhoe describes || this species in Formosa as “common on bushy and

\* Sulzer's figure really represents *Neptis sappho*.

† Mr. Moore states that specimens of this species “from Java are smaller than those from India, and have the central band broader and the portions closer together” (Horsf. & Moore, Cat. Lep. Mus. E.I.C. i. p. 170).

‡ Horsf. & Moore, Cat. Lep. Mus. E.I.C. i. t. V, fig. 11, 11 a.

§ Ibid. p. 170.

|| Proc. Zool. Soc. 1866, p. 359.

grassy places, fluttering and sailing through the air. Suck the sap of wounded trees. Males fight for the females."\*

2. *Athyma larymna*, var. ♂. (Tab. XVI., fig. 1 ♂.)

*Limnitis Larymna*, Doubleday and Hewitson, Gen. Diurn. Lep. t. 35, f. 1 (1850).

*Athyma Larymna*, Doub. & Hew. Gen. Diurn. Lep. p. 274, n. 7 (1850); Horsf. & Moore, Cat. Lep. Mus. E.I.C. i. p. 172, n. 352 (1857); Druce, Proc. Zool. Soc. 1873, p. 344, n. 1; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 540, n. 1 (1877).

Male and Female. Wings above dark fuscous, with the following dark cream-coloured markings †:— anterior wings with a basal streak followed by two spots in cell, and a large subtriangular spot at end of cell; two large subapical spots divided by the upper discoidal nervule, and preceded by a small subcostal linear spot; a large discal spot between the second and third median nervules, and two contiguous spots about centre of inner margin, which are divided by the submedian nervure; two submarginal series of small spots, the inner one waved and commencing near costa, the outer one commencing beneath the lower subcostal nervule, but fading into pale fuscous beneath the first median nervule; fringe alternately greyish from beneath apex; posterior wings with a transverse macular fascia before centre, a transverse series of subconical spots placed between the nervules, gradually enlarging towards abdominal margin, and situate on the outer portion of disk and a pale fuscous submarginal line. Wings beneath brownish ochraceous, the pale markings more or less clouded; anterior wings with the cellular spots fused into a single fascia, convex but deeply notched above: the spot at end of cell elongated, and preceded by an upper subquadrate spot; discal spots as above, the two series of submarginal spots as above, but of the inner series the two apical spots fuscous, surrounded by greyish, and the outer series obsolete till beneath the lower discoidal nervule, but then regular and distinctly greyish—this wing is also ornamented with a number of dark fuscous streaks and spots; posterior wings marked as above, but with an additional transverse basal fascia, curved and attenuated towards costal margin, the central fascia deflexed and continued on inner side of submedian nervure, the pale fuscous submarginal fascia above whitish beneath, and the fringe somewhat broadly alternately greyish. Body above dark fuscous; thorax with an anterior cream-coloured fascia, and abdomen with two fasciæ of the same colour, one basal and broad, the second subapical and narrow.

Exp. wings, ♂ 76 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.)—Java (Brit. Mus.)—Borneo (Druce).

I did not meet with this species in Province Wellesley, nor have I found it in any of the collections made there which I have since had the opportunity of examining. One male specimen, collected by Capt. Pinwill in Malacca, is my sole knowledge of the species in this fauna.

\* Allusion has already been made to the pugnacity of butterflies (*ante*, p. 91). In Britain this has long since been recorded. Thus Mr. Knapp, in his 'Journal of a Naturalist' (1829), remarks, "A few of our lepidopterous creatures, especially the common white butterflies of our gardens, are contentious animals, and drive away a rival from their haunts. We see them progressively ascending into the air, in ardent, unheeding contest"; and he also instances two species of our *Lycanidae* as of particularly combative nature. Haworth records a similar observation with respect to the "Purple Emperor" (*Apatura iris*). In Labuan Mr. Collingwood speaks of their "battles with one another, in which they whirl round each other with the greatest rapidity, and appear to be incited by the greatest ferocity" ('Rambles of a Naturalist,' p. 183); and Mr. J. M. Jones ('The Naturalist in Bermuda,' p. 120) describes *Junonia cænia* as "a most pugnacious little creature, and appears to love a quarrel, for you may see three or four of them ascending in the air and buffeting each other, now rising, now falling, unremittingly continuing their aerial warfare."

† These have been incorrectly delineated quite white in my figure, which was taken from a drawing made by Mr. Wilson of a Malaccan specimen in the British Museum.

3. *Athyma idita*. (Tab. XVI., figs. 9 ♂ and 10 ♀.)

*Athyma idita*, Moore, Proc. Zool. Soc. 1858, p. 16, n. 16, t. 51, f. 3; Druce, Proc. Zool. Soc. 1873, p. 344, n. 4; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541, n. 8 (1877).

Male. Wings above very dark fuscous or black, with the following pale bluish-white markings:—anterior wings with a long slender cellular streak and an irregular subtriangular spot at end of cell; two elongate subapical spots, divided by the upper discoidal nervule; an oblique discal series of five spots, of which the two upper and outer are smallest and situate on each side of the first median nervule, the fourth and fifth largest, and only separated by the submedian nervule; a submarginal series of small spots, of which the third and fourth are very minute, followed by two small spots, one on each side of the upper discoidal nervule; a marginal and submarginal narrow obscure dark fascia, between which the colour is slightly paler, and the fringe alternately greyish; posterior wings with a transverse macular fascia near base, and an outer discal series of contiguous subquadrate spots which are nearest outer margin near apex and most remote from the same at anal angle; a distinct pale fuscous submarginal fascia and the fringe alternately greyish. Wings beneath brownish ochraceous, white markings as above, but generally larger; anterior wings with the cellular streak and spots bounded with fuscous, the last followed by a fuscous line; submarginal spots much larger than above, the second to the sixth containing fuscous centres and slightly tinged with violaceous; a distinct outer submarginal series of linear subviolaceous spots not extending to apex; fringe as above; the colour beneath the third median nervule more or less fuscous; beneath cell is a cleft blackish spot followed by violaceous. Posterior wings marked as above, but with an additional basal curved fascia, the pale fuscous submarginal fascia above pale violaceous beneath, and the outer discal series of pale spots preceded by a series of lanceolate obscure dark castaneous spots; fringe as above; abdominal margin greenish. Body above concolorous with wings, the abdomen with a broad basal whitish fascia; body beneath greyish white, tinged with pale greenish, the intermediate and posterior tibiae and tarsi more or less tinged with brownish.

Female. Larger than the male, and with the pale spots and fasciæ larger.

Exp. wings, ♂ 58 to 63 millim.; ♀ 70 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist. and Säuer); Malacca (Pinwill—Brit. Mus.)—Java? (Moore).—Borneo (Druce).

In the British Museum are some specimens of this species labelled “India” (*sic*), but I have no other knowledge of it being found west of the Malay Peninsula.

4. *Athyma pravara*. (Tab. XVI., fig. 11 ♀.)

*Athyma pravara*, Moore (Horsf. & Moore), Cat. Lep. Mus. E.I.C. i. p. 173, n. 354, t. 5a, f. 4 (1857); Proc. Zool. Soc. 1858, p. 19, n. 22; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 541, n. 9 (1877).

Male and Female. Wings above dark fuscous or blackish, with the following pale lemon-coloured spots and markings:—anterior wings with a long cellular streak widening and rounded at apex; an oblique series of three subapical spots divided by the discoidal nervules, the central one of which is largest; these are followed by three small linear submarginal spots, divided by the second and third median nervules; three submarginal linear spots, divided by the discoidal nervules and an oblique discal series of three spots, the upper two largest, divided by the third median nervule, and the third linear contiguous to the second, and situate on inner margin; fringe alternately greyish; posterior wings with a transverse macular fascia near base, an outer discal series of subquadrate spots placed as in *A. idita*, and a pale fuscous submarginal fascia. Wings beneath olivaceous-brown, the pale markings as above, the posterior wings with an additional short pale basal fascia; a distinct series of fuscous spots above the outer discal macular

series, and the pale fuscous submarginal fasciæ above violaceous beneath, and margined inwardly and narrowly with fuscous; abdominal margin greenish; fringe of both wings as above, and anterior wings ornamented with a number of fuscous streaks and spots. Body above concolorous with the wings; thorax with an anterior transverse bluish-white fascia, and abdomen with a pale lemon-coloured sub-basal fascia;\* body beneath pale obscure greenish, the tibiæ and tarsi more or less pale brownish.

Exp. wings, ♂ and ♀, 48 to 54 millim.

HAB.—Malay Peninsula; Penang; Malacca; Singapore (Brit. Mus.)—Sumatra (Brit. Mus.)—Banca. †—Java (Moore); Bantam (coll. Dist.)—Borneo (Low—coll. Dist.).

The only variation I have seen in this species is in the size and hue of the pale markings; it is probably strictly confined to the Indo-Malayan region.

B. Cell of anterior wings more or less distinctly closed by a slender, suberect disco-cellular nervule.

b. Sexes alike or similar in colour and markings.

5. *Athyma abiasa*, var. *clerica*. (Tab. XVI., fig. 8 ♀.)

*Athyma abiasa*, Moore, Proc. Zool. Soc. 1858, p. 16, n. 15, t. 50, f. 7.

*Athyma clerica*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 540, n. 7 (1877).

The figure represents the type and only Malaccan specimen in the British Museum. Mr. Butler has inadvertently described it as a male, but it is clearly a female, and I think probably the other sex of Mr. Moore's species, which is also represented by the typical but solitary male specimen. I reproduce the original description:—

“Nearly allied to *A. abiasa*, but larger, the spots of primaries more oblique and larger, the sub-basal transverse white band of secondaries narrower; the discal series of spots much larger, more inarched above anal angle, forming a waved band, divided by the nervures; a well-marked greenish grey submarginal streak. Below much paler, with the differences of the upper surface; submarginal series of lituræ replaced by the submarginal streak, which is rosy greyish (not greenish, as above).”

“Exp. wings, 2 inches 7 lines.”

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.)—Java (Brit. Mus.).

6. *Athyma kresna*. (Tab. XVI., fig. 3 ♂.)

*Athyma kresna*, Moore, Proc. Zool. Soc. 1858, p. 12, n. 6, t. 50, f. 4; † Druce, Proc. Zool. Soc. 1873, p. 344, n. 2; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 540, n. 3 (1877).

Male and Female. Wings above dark fuscous or blackish, with the following bluish-white spots and markings:—anterior wings with a cellular streak, sometimes entire, and in some specimens (as the one figured) broken into a basal streak with two following and contiguous spots; a large subtriangular spot at end of cell; an oblique series of three subapical spots (the central largest), divided by the discoidal nervules, and followed by three linear spots placed between the nervules, with a very small and indistinct spot on inner margin; the three subapical spots outwardly followed by three linear apical spots; a large discal ovate spot between the second and third median nervules, and a large irregular spot before and a linear spot after the submedian nervure, at about centre of inner margin. Posterior wings with a transverse macular fascia near base and a curved outer discal series of subquadrate spots placed between

\* These two fasciæ have been unfortunately omitted in the figure.

† Collected by M. Teysmann (Pet. Nouv. Ent. vi. p. 404 (1874).

‡ I have not met with any specimens with the pale markings so decidedly blue as in Mr. Moore's figure.

the nervules; both wings with a narrow pale fuscous submarginal fascia and the fringe alternately greyish. Wings beneath olivaceous-brown; pale markings as above, but with the narrow submarginal fuscous fasciæ above, violaceous beneath, and with the dark fuscous macular markings as in *A. pravara*. Abdominal margin pale greenish. Body above dark fuscous, with an anterior transverse bluish fascia to thorax, and a basal bluish-white fascia to the abdomen. Body beneath greyish; legs pale brownish.

Exp. wings, ♂ 50 to 54 millim.; ♀ 62 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.)—Sumatra (Moore).—Borneo (Brit. Mus.); Sandakan (Pryer—coll. Dist.).

The female of this species is apparently a difficult insect to find, as all the specimens which I collected in Province Wellesley, or those which I have since received from the Peninsula, have been of the male sex. Both sexes, collected by Mr. Pryer in North Borneo, are now in my collection, and the female differs in no essential respect from the male.

#### 7. *Athyma amhara*, var. (Tab. XVI., fig. 5 ♂.)

*Athyma amhara*, Druce, Proc. Zool. Soc. 1873, p. 344, n. 6, t. 32, f. 2; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 540, n. 6 (1877).

Male. Wings above dark fuscous. Anterior wings with some very obscure and slightly paler markings in cell; an oblique discal bluish-white macular fascia, with the margins pale bluish, commencing immediately beneath apex of cell and between the second and third median nervules, and terminating about centre of inner margin; two subapical whitish spots separated by the upper discoidal nervule, followed beneath the second discoidal nervule by a third and very small spot, and two submarginal series of linear spots placed between the nervules, the inner one more or less whitish, the outer entirely pale fuscous. Posterior wings with a transverse bluish-white fascia, margined with pale bluish near base; an outer discal series of small linear whitish spots placed between the nervules, and a submarginal, narrow, pale fuscous, and somewhat macular fascia. Wings beneath pale olivaceous-brown; anterior wings with the pale whitish spots as above, but larger, the two submarginal series of linear spots almost totally pale violaceous, and with an irregular cellular streak, a spot at end of cell and one beneath cell between the third median nervule and submedian nervure pale violaceous; three slightly oblique dark castaneous linear spots partly crossing cell, and two rounded contiguous spots of the same colour beneath cell near base; a fuscous spot near cell between second and third median nervules; three longitudinal fuscous streaks divided by the discoidal nervules, followed beneath by a series of linear spots of the same colour placed between the nervules. Posterior wings with the whitish markings as above, but broader; the submarginal fascia pale violaceous; a basal curved whitish fascia, between which and the central fascia are some linear dark castaneous markings, and a series of dark castaneous spots placed before the outer discal pale fascia; abdominal margin pale greenish. Body both above and beneath more or less concolorous with wings; femora greyish white; tibiæ and tarsi pale fuscous.

Female.\* Similar to the male above; the anterior wings have the subapical spots larger; the cell with the base castaneous, and the discal fasciæ to both wings rather broader and almost quite without the bluish margins. Beneath the colour is reddish-ochraceous instead of olivaceous-brown, the darker markings castaneous, excepting the fuscous spots near the posterior angle of anterior wings; pale markings as on underside of male, but the discal fasciæ broad as above.

Exp. wings, ♂ 45 to 55 millim.

\* This description is taken from a female specimen collected in the Thoungyeen Valley, Tenasserim, and is the only example of that sex which I have as yet had an opportunity to examine.



HAB.—Tenasserim, Thoungyreen Valley (Brit. Mus.)—Malay Peninsula; Penang; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.)—Borneo (Druce).

As Mr. Butler remarks,\* “In the examples from Malacca the discoidal white streak of primaries is reduced to one or two dots, connected by a pale brown streak.” These white spots are altogether absent from the Penang specimen here figured, but are present in other Province Wellesley specimens in my own collection. Bornean typical species have a whitish streak and two whitish spots in cell of anterior wings.

If we admit (as is only reasonable) that this form is but the local race or variety of the Bornean species, it is at least only consistent to follow this view throughout the genus.

bb. *Sexes quite dissimilar in coloration.*

8. *Athyma nefte*, var. *nivifera*. (Tab. XVI., fig. 6 ♂ and 7 ♀.)

*Papilio nefte*, Cramer, Pap. Exot. iii. t. 256, E F (1782); Moore, Proc. Zool. Soc. 1858, p. 13, t. L. f. 5.

*Athyma nivifera*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 540, n. 5 (1877).

Male. Wings above dark fuscous or blackish. Anterior wings with a basal cellular streak closely followed by a rounded spot, succeeded by a triangular spot at end of cell, all more or less suffused with pale bluish; three subapical bluish-white spots placed obliquely and divided by the discoidal nervules; an oblique bluish-white macular discal fascia directed inwardly, commencing immediately beneath the second median nervule and extending to about centre of inner margin; a few small submarginal pale violaceous spots, and narrow fuscous submarginal and marginal fasciæ; fringe alternately whitish. Posterior wings with a transverse bluish-white fascia near base; an outer discal series of small subquadrate spots of the same colour placed between the nervules, and a very narrow pale fuscous submarginal fascia; fringe as on anterior wings. Wings beneath pale olivaceous-brown; pale markings as above, but with some additional central pale marginal markings on anterior wings, and a curved basal fascia to posterior wings; on these wings the pale fuscous submarginal fascia above is subviolaceous beneath, and both wings have the dark fuscous markings as in *A. amhara*; abdominal margin pale greenish. Body above concolorous with wings; thorax with an anterior bluish transverse fascia, and abdomen with a subbasal fascia of the same colour; body beneath and femora greyish; tibiæ and tarsi pale fuscous.

Female. Wings above very dark brown, with all the markings larger than in male and orange-yellow in hue; the subapical spots to anterior wings and the outer discal fascia to posterior wings being prominently broader. Wings beneath as above, but much paler, with the fuscous markings as in male.

Exp. wings, ♂ 54 millim.; ♀ 60 millim.

HAB.—India, *sic* (Brit. Mus.)—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Brit. Mus.)—Java (Brit. Mus.); Bantam (coll. Dist.)—Borneo (Brit. Mus.).

As I have treated this Malaccan insect as simply a variety of *A. nefte*, it is only right that I should give Mr. Butler's reasons for considering it a distinct species. He states that it may be at once distinguished from the Cramerian species “by the much narrower central band, which in the male is much more distinctly blue at the edges; by the longer and narrower trifold subapical band on the male and the deeper colour of the underside.” My own experience, however, has not allowed me to consider these characters as sufficiently constant to indicate a distinct species or race.

\* Trans. Linn. Soc. ser. 2, Zool. vol. i, p. 540.

bbb. *Sexes at present unknown to the writer.*

9. *Athyma subrata*. (Tab. XVI., fig. 4 ♀.)\*

*Athyma subrata*, Moore, Proc. Zool. Soc. 1858, p. 13, n. 10, t. li. f. 1; Druce, Proc. Zool. Soc. 1873, p. 344, n. 3.

*Athyma subrata*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 540, n. 4 (1877).

Not having received this species I have thought it best to figure a Malaccan specimen in the British Museum, and to add the original description of Mr. Moore:—

“Female. Upper side deep brown, with the markings disposed as in the female of *Athyma nefte*; but they are all narrower, and, instead of being of a deep orange colour, are suffused with very pale brown. The underside is also much darker, being of a light smoky brown, with all the markings white.”

“Expanse  $2\frac{1}{2}$  inches.”

HAB.—India (*sic*) (Brit. Mus.)—Malay Peninsula; Malacca (Brit. Mus.)—Sumatra (Moore).—Borneo (Druce).

10. *Athyma urvasi*. (Tab. XVI., fig. 12.)

*Athyma Urvasi*, Felder, Wien. Ent. Mon. iv. p. 400, n. 22 (1860); Reise, Nov. Lep. iii. p. 429, n. 683, t. 56, f. 4 (1866).

My knowledge of this species being confined to the description and figure of the Felders, I have here reproduced both:—

“Alis supra nigris, subtus brunneis, utrinque fascia communi submarginali maculari alba, anticarum striga clarata cellulari cum fascia lata discali sinuata connexa, posticarum fascia basali albis. ♂.”

HAB.—“Malacca Interior (Com. de Castelnau—coll. Feld.).”

### Genus HYPOLIMNAS.

*Hypolimnas* et *Esoptria*, Hübner, Verz. bek. Schmett. p. 45 (1816).

*Diadema* (nom. præoc), Boisd. Voy. Astr. Lep. p. 135 (1832); Feld. Neues. Lep. p. 25 (1861).

*Diadema*, sect. 1. *Dial.* et sect. 5. *Euralia*, Westw. Gen. Diurn. Lep. pp. 279–281 (1850).

*Apatura*, Moore (nec. Fabr.), Lep. Ceyl. i. p. 57 (1881).

Anterior wings subtriangular, the costal margin strongly arched and convex, the apex more or less rounded; outer margin concavely sinuate about centre; inner margin slightly concavely sinuate; costal nervure robust, about reaching centre of costal margin; first and second subcostal nervules emitted a little distance before end of cell and somewhat near together, third emitted at a little more than one-third from apex of cell; fourth and fifth bifurcating at about midway between base of third and apical angle; cell very broad, its apex almost truncate and closed by a suberect, slender, lower disco-cellular nervule, which is slightly directed outwards posteriorly; median nervules well separated, the first convex at base, the second almost straight and emitted a short distance from apex of cell. Posterior wings broadly subovate, the costal margin obliquely suberect at base and then deflected and nearly straight, but becoming convexly oblique towards apex; outer margin convex and waved; abdominal margin almost straight to about abdominal apex and then somewhat concavely sinuate to anal angle. Precostal nervure suberect, its apex convexly directed outwardly; costal nervure extending to apex of wing; lower disco-cellular nervule slender and concavely directed outwardly; first and second median nervules with an apparently

\* The colour in the figure here given has been rendered too ochraceous.

common origin at the end of cell; the third median and first subcostal nervules almost subequal in length. Body moderately robust; palpi porrect, not reaching the upper margin of the eyes, but extending considerably beyond them, squamose beneath, and with the apical joint pointed; antennæ with a moderately strongly incrassated apex or club.

This is an extensive genus, though it is somewhat difficult to assess the number of its species, owing to the present uncertainty as to whether many of its members are either so-called species or simply varieties of other species. It has an extensive distribution, being found in all the great Zoological Regions, excepting the Palearctic, although it may possibly yet be discovered in the extreme eastern portion of that region. It is, however, in the Oriental Region that the genus reaches its maximum in number of species, whilst it is very poorly represented in the Nearctic and Neotropical Regions, and evidently there by an introduced species.

1. *Hypolimnas bolina*. (Tab. XII., figs. 10 and 12 ♂; XV., fig. 12 ♀.)

*Papilio Bolina*, Linnæus, Syst. Nat. ed. x. p. 479, n. 124 (1758); Clerck, Icones Ins. ii. t. 21, f. 2 (1764); Houtt. Naturl. Hist. i. 11, p. 331, n. 124 (1767); Müll. Natur. V. i. p. 614, n. 188 (1774); Fabr. Syst. Ent. p. 507, n. 269 (1775); Spec. Ins. ii. p. 95, n. 414 (1781) (part); Mant. Ins. ii. p. 50, n. 499 (1787) (part); Gmel. Syst. Nat. i. 5, p. 2323, p. 188 (1790) (part); Thunb. Mus. Nat. Ups. xxiii. p. 8 (1804).

*Diadema Bolina*, Wall. Trans. Ent. Soc. 1869, p. 278, n. 1 (part); Druce, Proc. Zool. Soc. 1874, p. 105, n. 1; Snell. Tijds. Ent. xix. p. 148, n. 23 (1876); *ibid.* xx. p. 66 (1877).

*Hypolimnas Bolina*, Kirby, Cat. Diurn. Lep. p. 224, n. 1 (1871) (part); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 543, n. 1 (1877); Wood-Mas. & de Nic. Journ. Asiat. Soc. Beng. vol. xlix. pt. 11, p. 228, n. 24 (1880); *ibid.* vol. l. pt. 11, p. 233, n. 22 (1881); Aurivill. Kongl. sv. vet. Ak. Handl. Bd. 19, no. 5, p. 96 (1882).

*Apatura Bolina*, Moore, Lep. Ceyl. i. p. 58, t. 30, f. 1 (1881).

Male. Wings above very dark indigo-blue. Anterior wings with a large elongate and macular white spot at end of cell, margined with bright bluish, commencing near the upper discoidal nervule and terminating near the second median nervule; two or three small subapical white spots divided by the fourth and fifth subcostal nervules, and sometimes followed by a few minute submarginal whitish spots placed between the nervules. Posterior wings with a large central white spot, broadly and irregularly surrounded by pale bluish, which commences on lower half of cell, and is bounded by the upper subcostal and the third median nervules; a series of minute and frequently subobsolete submarginal white spots placed between the nervules. Fringe of both wings alternately white. Wings beneath dark olivaceous-brown. Anterior wings with the white markings as above, but with the large macular spot at end of cell almost extending to costa, not prominently margined with bluish, and followed by a small pale spot beneath the second median nervule; submarginal spots distinct, one on each side of third median nervule largest and bluish; a pale lunulate submarginal fascia and a similar but more linear marginal fascia, which are almost obsolete above the lower discoidal nervule; basal half of costal area minutely irrorated with greyish; cell with three upper small and irregular white spots more or less surrounded with dark fuscous. Posterior wings with a broad central whitish fascia, commencing near upper subcostal nervule, where it is preceded by a subcostal spot, and terminating near anal angle (this fascia is variable both in size and shape); a submarginal series of small bluish white spots placed between the nervules, followed by a submarginal series of greyish subconical spots placed in pairs between the nervules; marginal linear lunulate spots as on anterior wings; fringe as above. Body above dark indigo-blue, the head marked with a few pale spots; body beneath and legs more or less concolorous with wings, the palpi beneath white, the legs beneath more or less greyish, and the abdomen and thorax with a few whitish spots.

Female. Wings above dark olivaceous-brown. Anterior wings with a few small bluish subcostal spots above cell; a transverse blue macular fascia beyond end of cell (corresponding to the white fascia of male); a submarginal series of white spots placed between the nervules, the two uppermost of which are largest and contiguous, followed by a submarginal and marginal series of waved and linear greyish spots, between which the colour is somewhat paler. Posterior wings with a submarginal series of greyish spots placed between the nervules, followed by a series of subconical spots of the same colour, which are placed conjointly in pairs between the nervules; marginal spots as on anterior wings, but more lunulate; fringe of both wings alternately greyish. Wings beneath brownish ochraceous: anterior wings with the marginal and submarginal markings as above, the macular fascia at end of cell subobsolete and greyish; the basal half of wing is pale castaneous, with the costal area and cell marked as in male; posterior wings with the marginal and submarginal markings as above, and the centre crossed by a faint greyish fascia more or less corresponding to that on the wings of the male.

Exp. wings, ♂ 70 to 78 millim.; ♀ 84 millim.

HAB.—Continental India: Silhet; Nepal (Brit. Mus.)—Ceylon (Moore).—Andaman Islands (Moore).—Nicobar Islands; Great Nicobar; Tillangschong (Wood-Mas. & de Nic.)—Burma; Moulmein (Brit. Mus.)—Malay Peninsula; Quedah (coll. Dist.); Province Wellesley (coll. Dist. & Saüer); Malacca (Pinwill—Brit. Mus.)—Sumatra (Snellen).—Java; Batavia (Snellen).—Siam; Chentaboon; Nahconchaisee (Druce).

There is no doubt of this being a variable species, though we need not necessarily follow Mr. Kirby\* to the full extent of his varietal speculations, and though, in one philosophical sense he is most probably correct, on the other hand a number of local races have now become so well established that the much-vexed, contested, and, in some quarters, almost deified term “species” must necessarily be applied.† The two males which I have figured—the first from Quedah and the second from Province Wellesley—sufficiently show inconstancy of type, and Dr. Aurivillius‡ has added (and doubtless correctly added) several names to the synonymy, which I have only refrained from copying here, owing to the exigencies of the treatment of a local fauna.§

The late Mr. Darwin, in reference to his theory of “sexual selection,” has drawn attention to the colour-markings of the male of this species, to which his attention had been called by Dr. Schulte, of Fürstenwalde. The markings of the male when viewed from behind are pure white, “but when viewed in front, in which position, as Dr. Schulte remarks, the male would be seen by the female when approaching her, the white markings are surrounded by a halo of beautiful blue.”||

The Bros. de Alwis have given drawings of the larva and pupa of this species as found in Ceylon,¶ which Mr. Moore has described\*\* as “Larva purple-brown; head armed with two long erect branched spines, the segments with a dorsal row of three (two only on the anterior

\* Cat. Diurn. Lep. p. 224 (1871).

† My friend Mr. Kirby has informed me that in making this excellent Catalogue, in the unentomological—and, as regards libraries, uncongenial—habitat of Dublin, he depended much on the assistance of the late Mr. Hewitson, owing to that gentleman's then unrivalled collection. It is more than an open secret that Mr. Hewitson altogether failed to grasp the initial elements of evolution, and yet, strange to say, though, as is so frequently the case, his cabinets—in which allied and, in some cases, remotely allied forms are placed under one name, to the great scandal of the conscientious specific discriminator—bear eloquent witness to at least his own view of the mutability of species.

‡ Kongl. sv. vet. Ak. Handl. Bd. 19, no. 5, p. 96 (1882).

§ Authorities have differed as to the proper recognition of these allied forms. Thus Butler (Proc. Zool. Soc. 1874, p. 282) has maintained that the “*Bolina* group” contains “several distinct and well-marked species,” whilst the direct contrary is affirmed by Schmeltz (Verhandl. d. Ver. f. naturwissensch. Unterh. z. Hamb. ii. pp. 184 and 185).

¶ ‘Nature,’ vol. xxi. p. 237.

• Lep. Ceyl. i. t. 30, fig. 1 b.

\*\* Ibid. p. 58.

and posterior segments) long branched red spines, and three lateral rows of spines. Pupa thick, purple-brown, blotched with black; abdominal segments with stout pointed dorsal tubercles; head obtuse, pointed in front; thorax angular at top." The larval food-plant is not given; but Mr. Lockwood, at Monghyr, found the perfect insect on the leaves of the "creeping fig" (*Ficus repens*),\* which may, or may not, give some clue to the same.

## 2. *Hypolimnas incommoda*. (Tab. XVII., fig. 8 ♂, 9 ♀.)

*Hypolimnas incommoda*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 543, n. 2 (1877).

The male and female typical specimens, which are contained in the British Museum, and are here figured, constitute at present our sole knowledge of the species. I therefore simply append the original description:—

"♂ very similar to the male of *H. bolina*, but with the subapical band of primaries straighter on the underside, and the pale brown submarginal spots narrower and darker; expanse of wings, 3 inches 1 line. ♀ differs from the female of *H. bolina* in having a broad oblique subapical white band on the upperside of primaries, a large diffused sordid white patch just beyond the cell of secondaries, and the submarginal spots all separated, small, and pale brown: expanse of wings, 3 inches 11 lines."

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).

## 3. *Hypolimnas misippus*. (Tab. XII., figs. 9 and 11 ♂; XV., fig. 11 ♀.)

*Papilio Misippus*, Linnaeus, Syst. Nat. ed. xii. p. 767, n. 118 (1758); Müll. Naturs. V. i. p. 597, n. 118 (1774).

*Papilio Bolina*, Dru. (nec Linn.), Ill. Ex. Ent. i. t. 14, f. 1, 2 (1773); Cram. Pap. Ex. i. t. 65, E, F (1779).

*Papilio Diocippus*, Cram. Pap. Exot. i. p. 44, t. 28, B, C (1775); Fabr. Ent. Syst. iii. 1, p. 51, n. 158 (1793).

*Papilio Chrysippus*, Sulz. Gesch. Ins. p. 114, t. 16, f. 3 (1776).

*Papilio Chrysippus*, β. *Diocippus*, Gmel. Syst. Nat. i. 5, p. 2279, n. 119 β. (1790).

*Euploea Dioxiippe*, Hübn. Verz. bek. Schmett. p. 15, n. 83 (1816).

*Danaïs Misippe*, Godt. Enc. Méth. ix. p. 188, n. 40 (1819).

*Nymphalis Misippe*, Godt. Enc. Méth. ix. p. 394, n. 153 (1823).

*Diadema Bolina*, Boisdu. (nec Linn.), Faune de Madag. p. 39, n. 1 (1833); Lucas, Sagra, Hist. de Cuba, p. 569 (1853); Trim. Rhop. Afr. Austr. p. 153, n. 91 (1862).

*Apatura Misippus*, Moore, Lep. Ceyl. i. p. 59, t. 29, f. 1 b (1881).

*Diadema Misippus*, Mab. Bull. Soc. Zool. de Fr. 1876, p. 275; Snell. Tijd. Ent. xix. p. 149, n. 25 (1876); ibid. xx. p. 66 (1877).

*Hypolimnas misippus*, Kirby, Cat. Diurn. Lep. p. 225, n. 2 (1871); Wood-Mas. & de Nic. J.A.S. Beng. vol. L. pt. 11, p. 233, n. 21 (1881); Aurivill. Kongl. sv. vet. Akad. Handl. Bd. 19, no. 5, p. 71 (1882).

Male. Wings above very dark indigo-blue; anterior wings with an oblong subapical white spot divided by the fourth and fifth subcostal nervules; a large elongated white spot on disk passing apex of cell, commencing beneath subcostal nervure and terminating between the second and third median nervules; posterior wings with a large irregularly rounded discal white spot, commencing on lower half of cell and bounded by the first subcostal and the third median nervules; these spots on both wings are surrounded by bright but evanescent blue; fringe alternately greyish. Anterior wings beneath with the large discal spot as above, but extending to costa, and more or less margined with fuscous, and before which the colour is pale castaneous, beneath it fuscous and beyond it ochraceous; basal half of costal area fuscous, irrorated with minute bluish grey spots; cell with three upper white spots broadly and irregularly surrounded with black; subapical spot as above, followed by a small spot on each side of lower subcostal

\* 'Nat. History, Sport. and Travel,' p. 264.

nervule and a minute spot on each side of third median nervule; two narrow submarginal bluish-grey fasciæ, bordered on each side with fuscous. Posterior wings reddish ochraceous, crossed by a broad white fascia, commencing at costal nervule where it is broadest, and terminating near the internal nervule where it is narrowest, and which is inwardly straight and anteriorly margined with fuscous; it is outwardly notched at upper subcostal nervule, and then rounded to submedian nervule, where it is somewhat prolonged towards anal angle, and there contains an angulated black spot, and also an irregular black spot situate between the costal nervule and upper subcostal nervule; a basal black spot before the precostal nervule, a submarginal series of small bluish-white spots placed between the nervules, and submarginal fasciæ as on anterior wings. Body above concolorous with wings, and with the head spotted with white; body beneath fuscous, spotted with white; legs fuscous, greyish white beneath; palpi (excluding apices) white beneath.

Female. Wings above reddish ochraceous. Anterior wings with rather less than apical half, beginning at base, gradually widening across apex of cell and narrowly terminating at posterior angle, black, containing a waved series of five white spots placed between the nervules, the first smallest and linear, the second and third subquadrate, fourth and fifth more or less rounded; this series is preceded by about two small subcostal white spots and followed by a waved series of four small subapical white spots, the two uppermost largest; two submarginal series of small bluish-white spots, not distinctly extending beyond the third median nervule, and fringe alternately greyish. Posterior wings with a large central black spot beneath the costal nervule, and a marginal black fascia preceded by some small paler and indistinct spots, and containing a series of lunate ochraceous spots placed between the nervules, bluish at anal angle; fringe as on anterior wings. Anterior wings beneath as above, but with the apex beyond the transverse spots ochraceous and not black; posterior wings with the disk whitish; a basal spot and a central subcostal spot as in male, and a black spot at end of cell; a broad white marginal fascia containing three waved black lines, and preceded by a series of small white spots.

Exp. wings, ♂ 62 to 70 millim.; ♀ 72 to 85 millim.

HAB.—Africa; Senegal; Congo; Gabon (Mabille); Angola (Monteiro—Druce\*); Natal; Damaraland (Trimen); Delagoa Bay (coll. Dist.); Abyssinia (Antinori—Oberthür†).—Madagascar (Boisduval).—Ceylon (Moore).—Nicobar Islands; Nankowri (Wood-Mas. & de Nic.)—Malay Peninsula; Province Wellesley (coll. Dist.).—Sumatra (Snellen).—Java; Batavia (Snellen).—Celebes (Snellen).—Siam: Chentaboon (Druce‡).—Formosa (Brit. Mus.)—America; Florida (Edwards§).—Cuba (Lucas).—Antigua (coll. Hewits.)—Trinidad. ¶

Males of this species differ in size and also in the shape of the white markings, as the two Province Wellesley specimens here figured (Tab. XII., figs. 9 & 11) sufficiently testify.

This species in its female sex affords one of the best and strongest examples of "mimicry," it being a true and startling mimic of *Danais chrysippus*, a protected species which is found with it in its different habitats, excluding America, where, however, it is evidently an introduced species. ¶ According to Boisduval, \*\* this resemblance is even found at first sight, in the larvæ of the two species, which in South Africa feed upon the leaves of the Oleander. ††

\* Proc. Zool. Soc. 1875, p. 409.

† Annal. del Mus. Civ. di St. Nat. di Genova, vol. xv. p. 167, n. 49 (1880).

‡ Proc. Zool. Soc. 1874, p. 106.

§ 'Papilio,' vol. i. p. 30 (1881). This species is recorded as *D. bolina*, but as Drury's figure is referred to, no misapprehension can arise.

¶ Mr. Meldola informs me he has received the species from Trinidad.

¶ Mr. Meldola (Ann. & Mag. Nat. Hist. ser. 5, vol. i. p. 157), in communicating some notes from that excellent observer Fritz Müller, and in reference to this fact, observes that it is "quite conceivable" that the mimicked species (*D. chrysippus*) may have become altogether extinct. On the other hand, it seems more probable that the *Hypolimnas* is an introduced species than to suppose that such a widely distributed Danaid should have become extinct over such a wide area, in which other tawny species of the genus find an extensive and congenial home, the food-plant (*Asclepias*) being the same for the different species. Moreover, we have record of the migratory habits of this *Hypolimnas*. Mr. Newman ('Entomologist,' vol. iii. p. 226) recorded the species under the name of *D. bolina*, Boisd., as having reached a ship during a cyclone, about six hundred miles from the West Coast of Africa, and two hundred miles from the Cape de Verd Islands.

\*\* Faun. Ent. Madag. p. 40.

†† Trimen, Rhop. Afr. Austr. p. 155.

To add to the reasonableness of this explanation we have the following cumulative evidence:— In Eastern Africa and South-Western Asia an allied species to *Danais chrysippus* is found—the *D. dorippus*, Klug—and here we find also a closely-allied species to, or a local race of, *Hypolimnas misippus*,—the *H. inaria*, Cram.,—the female of which is a close mimic of Klug's Danaid.\* And quite recently Mr. Butler has described,† from the Victoria Nyanza, another species of the genus, under the name of *H. alcippoides*, which is a mimic of the African *Danais alcippus*.

### *Hypolimnas anomala*.

*Diadema anomala*, Wallace, Trans. Ent. Soc. 1869, p. 285, n. 15.

The species is only known to me by Mr. Wallace's description:—

“*Male*. Form of *D. Antilope*, rather smaller.”

“*Above*; bronzy or olive-brown, with a blue gloss on the costal and outer margins of the anterior wings, and the outer part of the hind wings paler. A row of white round spots parallel to the outer margin as in *D. Antilope*, but larger and more distinct; a band of three white or bluish-white marks, sometimes very indistinct, across the anterior wings beyond the middle; marginal and submarginal spots as in *D. Antilope*. *Beneath*; olive-brown, spots and markings as above, with one additional white spot on the costal margin.”

“*Female*. *Above*; rich purple-brown, the whole surface of the upper wings, except the basal third, richly glossed with satiny blue; a transverse band of three bluish elongate spots beyond the cell, and a fourth much smaller; the two white spots of the intra-marginal band nearest the costa large and confluent, while those nearest the anal angle are small and indistinct. *Beneath*; as in male.”

HAB.—Malay Peninsula; “Malacca” (♂).—“Java” (♀) (coll. Wallace).

\* A closely allied species or race of *H. misippus* has recently been described from Guinea by Herr Dewitz under the name of *H. poggei* (Verh. L.-C. Ak. Naturf. xli. (2), p. 25, t. 2, f. 2), and it will be interesting to discover whether a racial modification of *D. chrysippus* has also ensued in that habitat.

In relation to the need of protection required by butterflies from birds and other enemies, necessarily postulated in the doctrine of “mimicry,” it is somewhat remarkable how some able entomologists and many other collectors have failed to see this phase of the struggle for existence in the butterfly world. Thus Mr. S. Scudder, writing from North America (‘Nature,’ vol. iii. p. 147), states, “Although I have hunted butterflies for fifteen years I confess I have never seen one in a bird's bill, and my faith in that method of lessening their numbers is very slight;” and Mr. H. H. Higgins (‘Notes of a Field Naturalist in the Western Tropics,’ p. 35) records that during three days he watched two species of Flycatchers actively at work, and that “not a butterfly of any kind was touched”; and further, that during “the entire journey I did not see a butterfly of any kind attacked by a bird.” In striking contrast to these doubts are the affirmations of many distinguished naturalists and travellers. Thus Mr. Belt (‘Naturalist in Nicaragua,’ p. 316) observed “a pair of birds that were bringing butterflies and dragonflies to their young.” Mr. T. P. Bigg-Wither (‘Pioneering in South Brazil,’ vol. i. p. 292), speaking of a bird known by the local name of “Suruqua,” relates that its “principal food consists of butterflies and other soft-bodied flying insects.” Mr. P. H. Gosse (‘Birds of Jamaica,’ p. 194), writing of one of the Greenlets (*Vireosylbia calidris*), remarks that he has seen one in eager but unsuccessful pursuit of a butterfly (*Terias*). Mr. Wallace is a witness that “in the Brazilian forests there are great numbers of insectivorous birds—as jacamars, trogons, and puff-birds—which catch insects on the wing, and that they destroy many butterflies is indicated by the fact that the wings of these insects are often found on the ground, where their bodies have been devoured” (‘Natural Selection,’ p. 79). In Southern India Mr. E. L. Arnold (‘On the Indian Hills,’ vol. i. p. 247-8) describes *Terias hecate* and *Papilio pammon* as apparently “the principal victims of the graceful green bee-eaters, a pair of which had their perches on the woodwork of a disused well, and every now and then made rapid darts at passing insects. They never missed their prey, and always brought their quarry back to the same spot to be diswinged before being swallowed, the ground under their watch-towers being thickly strewn with gaily painted shreds of unfortunate butterflies and bees.” Such quotations could be considerably increased if space permitted.

Besides the numerous foes of butterflies, as birds, lizards, dragonflies, &c., may be added at least some of the “foraging-ants.” Dr. F. Ellendorf, at Nivas in Nicaragua, describes having met a column with “all the ants laden with leaves, beetles, pupæ, butterflies, &c.” (Quoted by Büchner, ‘Mind in Animals,’ Eng. transl., p. 98). As to lizards, Mr. R. W. Shufeldt has recently (Amer. Nat. vol. xvii. p. 924-5) described seeing the American Chameleon (*Anolis principalis*) make “a successful spring upon rather a large butterfly,” and having silenced its prey, “tore off the creature's wings, and disposed of his body sans cérémonie.”

† Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 102.

## Genus CETHOSIA.

*Cethosia*, Fabricius, Ill. Mag. vi. p. 280 (1807); Doubl. Gen. Diurn. Lep. p. 150 (1848); Moore, Lep. Ceyl. vol. i. p. 51 (1881).

*Alazonia*, Hübn. Verz. bek. Schmett. p. 46 (1816).

Anterior wings subtriangular; costal margin arched and convex, the apex rounded; outer margin oblique and dentately waved; inner margin slightly concave about centre. Costal nervure extending to about two-thirds of the costal margin; first subcostal nervule emitted a little before the termination of the cell, second at a short distance beyond cell, third at about midway between end of cell and apex of wing, fourth and fifth bifurcating nearer base of third than apex of wing; upper disco-cellular nervule very short, middle disco-cellular oblique and concave, lower disco-cellular almost twice the length of the middle and slightly concave; discoidal nervules emitted beyond basal third of wing; first and second median nervules with an apparently common origin at end of cell, the first strongly curved near base. Posterior wings broadly subovate, costal margin obliquely convex, outer margin rounded and dentately waved, abdominal margin straight and oblique to beyond apex of abdomen and then obliquely excavated at anal angle; costal nervure extending to apex; first subcostal nervule emitted at about one-fourth from end of cell; disco-cellular nervules (the lower disco-cellular present) oblique and concavely bent; first and second median nervules with an apparently common origin at end of cell, the first strongly curved at base. Body moderately robust; palpi porrect, raised above the level of the head, strongly villose beneath, third joint small and pointed; antennæ long, with a somewhat slender club.

*Cethosia* is a truly eastern genus, being found in Continental India, Ceylon, Andaman and Nicobar Islands, Burma, Tenasserim, and onwards through the Malay Peninsula, the whole Malayan Archipelago, Papua, and Australia. Most of the species have a common facies, as is shown in those belonging to this fauna, though New Ireland, Timor, and Java produce very distinct, and—as far as colour markings are concerned—somewhat aberrant species.

The larva of *C. cyane*, in Southern India, has been delineated by Mr. S. N. Ward, and published in Horsfield and Moore's Catalogue,\* whilst that of the Ceylon species has been portrayed by the Bros. de Alwis, and published in Moore's 'Lepidoptera of Ceylon.'

In both cases these larvæ are gaily coloured with red and yellow bands, with dorsal slender and finely branched spines, and with a pair of suberect processes to the head.

In India Capt. Mortimer J. Slater observed the transformations of "a species of *Cethosia*, from a larva feeding on the passion-flower," and he describes the spines as "stinging." †

1. *Cethosia logani*. ‡ (Tab. VIII., fig. 5 ♂.)

*Cethosia Logani*, Distant, Ent. Month. Mag. vol. xviii. p. 134 (1881).

Male. Anterior wings above with the basal third bright red, remainder black with white markings; cell crossed by three pairs of narrow black fasciæ, the last pair somewhat indistinct, owing to the proximity

\* Cat. Lep. Mus. E.I.C. i. p. 155, t. v. f. 8.

† Ibid. p. 155. Caterpillars possessing "stinging hairs" or other uneatable qualities are, as a rule, brilliantly marked and coloured so as to be conspicuous even at a considerable distance. Mr. Wallace proposed a very philosophical explanation of this fact:—"Distastefulness alone would, however, be of little service to caterpillars, because their soft and juicy bodies are so delicate, that if seized and rejected by a bird they would almost certainly be killed. Some constant and easily perceived signal was therefore necessary to serve as a warning to birds never to touch these uneatable kinds, and a very gaudy and conspicuous colouring, with the habit of fully exposing themselves to view, becomes such a signal, being in strong contrast with the green or brown tints and retiring habits of the eatable kinds" ('Natural Selection,' p. 188). This view requires to be reconciled with the theory of "experimental knowledge" lately put forward in connection with insectivorous birds and inedible butterflies.

‡ This species is dedicated to the late J. R. Logan, of Penang, who, by the possession of a vast and varied oriental learning, focussed in himself the whole centre and direction of scientific study in the Straits Settlements, and who, by founding and sustaining the 'Journal of the East Indian Archipelago,' has left no inconsiderable evidence of the same.



of the black area; an indistinct arcuated spot beneath cell, and two somewhat waved linear spots separated by the third median nervule; the dark area contains the following white markings:—four spots a little beyond end of cell, of which the third is very small; beyond these are three large lanceolate spots, indistinctly margined with white, divided by the discoidal nervules, and outwardly followed by a series of five small spots situate between the nervules; a very large and irregular subquadrate spot bounded by the first and third median nervules; a small lunate spot beneath the third median nervule, and a submarginal row of large but somewhat obscure lunately linear spots. Posterior wings bright red, with the outer margin broadly black, which is inwardly bordered with a series of irregular spots of the same colour, and with nine or ten scattered and irregular black spots on the basal area; the broad black marginal border contains two small red spots divided by the discoidal nervule, and a submarginal series of large pale, but obscure lunately linear spots. Anterior wings beneath much paler, the black apical area being brownish-ochraceous; cell crossed as above, but the colour between the black fasciæ violaceous, all the white markings either larger or more distinct, the lanceolate spots beyond cell being wholly greyish white, containing inwardly an ovate, linear black spot, and outwardly two rounded black spots; the marginal lunately linear spots paler and with central pale lines. Posterior wings paler and of the same hue as the anterior wings, with a black subcostal line at base surrounded with greyish; an oblique greyish fascia near base margined with black, each margin with a double termination at abdominal margin; a similar greyish fascia crossing centre of wing, with much-broken black margins, the outer of which is very pale; a broad greyish outer discal fascia containing a series of small black spots near its outer margin, which is black, and with a similar but poorer and more irregular series near its inner margin, which is also more or less black; outer marginal lunate spots as on anterior wings, but more broadly margined with black. Body more or less reddish ochraceous.

Female. Almost indistinguishable from the male, but with the white markings of the anterior wings a little larger.

Exp. wings, 73 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.).

This species is most nearly allied to *C. nicobarica*, Feld., which is found both in the Andaman and Nicobar Islands; it is somewhat intermediate between that and the following species, *C. methypsea*.

## 2. *Cethosia methypsea*. (Tab. VIII., fig. 9 ♂.)

*Cethosia methypsea*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 1 (1877).

Male. Anterior wings above resembling those of *C. logani*, but the basal reddish area less black-spotted and the apical black area crossed a little beyond cell by an oblique series of six pale spots (ochraceous-white or greyish-white) placed between the nervules, the upper three being minute, and the fifth and sixth notched with black; between the lower spot and the costa is a waved outer series of four small spots.\* Posterior wings with the outer black margin narrower than in *C. logani*, and without the numerous black discal spots. Wings beneath with the ground colour and the cellular markings of the anterior wings generally as in the preceding species; anterior wings with a broad oblique ochraceous-white or greyish-white fascia a little beyond the cell, the upper part of which is margined with small black spots, which are then deflexed and obliquely continued across wing, where they become the inner margin of an oblique discal subtriangular pale fascia; both these fasciæ are also outwardly margined with blackish, and the upper one terminates in a narrow pale submarginal fascia, which contains a series of black spots; outer margin much as in *C. logani*. Posterior wings with the basal and subbasal fasciæ as in the preceding

\* These have been omitted by the artist.

species, and with a broad central irregular and much-waved pale fascia, which is inwardly margined with black spots; a black spot in cell; a submarginal narrow pale fascia inwardly margined with small rounded black spots and outwardly by narrow linear black spots; outer margin much as in *C. logani*.

Female. More ochraceous than the male; black area of the anterior wings rather larger, the oblique macular fascia above larger, continuous, and much more pale ochraceous, and the connecting spots with costa also more distinct; the pale disks of both wings are also a little more black-spotted. Wings beneath as in male.

Exp. wings, ♂ 80 millim.; ♀ (one spec.) 60 millim.

HAB.\*—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.)

I only possess one female specimen of this species, and should incline to the view that it must be abnormally small in size, as the above-given dimension testifies.

The males vary in having the pale markings either ochraceous-white or nearly pure greyish-white.

### 3. *Cethosia hypsina*. (Tab. VIII., figs. 6 and 7 ♂; 8 ♀.)

*Cethosia hypsina*, Felder, Reise Nov. Lep. iii. p. 385, n. 559 (1866); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 543, n. 2 (1877).

Male. Wings above as in *C. methypsea*, but the black area larger and occupying the cell, which is crossed by some indistinct reddish fasciæ (obsolete in some specimens); an oblique and very much sinuated pale ochraceous or greyish-white macular fascia situate a little beyond cell and terminating a little beneath the second median nervule, but without the outer pale spots as in *C. methypsea*; posterior wings as in that species, but with the black margin somewhat broader, its enclosed pale lunate lines clear and distinct, and the discal area more black-spotted. Wings beneath as in *C. methypsea*, but the red colouring darker; the posterior wings have the central pale fascia situate farther from the base, and the series of linear and rounded black spots are nearer the black margin and not placed at the margins of a narrow pale fascia; on the anterior wings the narrow pale submarginal fascia is replaced by a series of dark spots situate nearer the outer margin.

Female. Wings above generally paler and more ochraceous than the male, the black area to the anterior wings much larger and occupying the whole wing, with the exception of the oblique macular fascia beyond cell and a large subtriangular space on inner margin, which does not extend above the third median nervule, and is there distinctly paler; wings beneath as in the other sex.

Exp. wings, ♂ 70 to 80 millim.; ♀ 73 to 78 millim.

HAB.—Continental India; Nepaul (Brit. Mus.)†—Malay Peninsula; Province Wellesley (colls. Dist. and Säuer); Malacca (Pinwill—Brit. Mus.).

This species is a near ally to *C. hypsea*, a Bornean species; the males are very similar, but the females are sufficiently distinct.

\* Mr. Butler remarks (Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 543), "We have a female from Assam." This is probably one of the insects so localised on the authority of Mr. Warwick, but Mr. Wood-Mason has confided to me his opinion that none of the insects labelled "Assam—Warwick" were really collected in that district, and as he has large collections of Assam butterflies under his care at Calcutta, I have accepted his report, and have not quoted the habitat.

† Mr. Butler also states the British Museum collection contains the species from Assam; but, as previously stated, that habitat is open to great doubt, and I have not used it.

## Genus ATELLA.

*Atella*, Doubleday, Gen. Diurn. Lep. p. 165 (1848); Moore, Lep. Ceyl. i. p. 61 (1881).

*Phalanta*, Horsf. Cat. Lep. E.I.C. t. 7, f. 5 (1829).

Anterior wings subtriangular; costal margin arched and convex, the apex rounded; outer margin oblique, moderately concave, and slightly waved; inner margin concavely sinuated. Costal nervure terminating at about centre of margin; first subcostal nervure emitted just before the end of cell, second at a little distance beyond cell, third emitted at about twice the distance from second as that nervure is from the first, fourth and fifth bifurcating about midway between base of second and apex of wing; upper disco-cellular nervule short and obliquely directed inwardly, middle disco-cellular concavely bent, lower disco-cellular suberect and more or less concave; discoidal nervules emitted beyond basal third of wing; second median nervule emitted at base of lower disco-cellular nervule. Posterior wings subovate; costal margin oblique and slightly convex; outer margin rounded and waved, in some species prominently caudate at apex of first median nervule; abdominal margin straight at area of abdomen and then obliquely divergent to anal angle. Costal nervure extending to apex; precostal nervure curved outwardly; disco-cellular nervules almost equal in length, the upper distinctly concave, the lower slender and also bent inwardly, with the second median nervule emitted at about its base. Body moderate in size; palpi reaching above the upper surface of the eyes, finely pilose, the apex slender and conically pointed; antennæ moderate, with a compressed and spatulate apex or club.

This is a genus of moderate extent, which is found in Africa, and extends generally throughout the Oriental region and the Malayan Archipelago.

The immature forms—both larval and pupal—of one species found in this fauna have been figured by Horsfield,\* as observed in Java, and by the Bros. de Alwis,† in Ceylon. These figures probably represent two different stages in the existence of the caterpillar, as the Ceylon figure is small and “purple-brown,” whilst that of the Javan larva is considerably larger and pale greenish above.‡



FIG. 45.—Larva of *Atella phalanta*, from Horsfield's Cat. Lep. E.I.C.

a. *Outer margin of posterior wings rounded, not caudate.*

1. ***Atella phalanta***. (Tab. IX., fig. 4 ♂.)

*Papilio phalanta*, Drury, Ill. Ex. Ent. i. t. 21, f. 1, 2 (1773).

*Papilio columbina*, Cram. Pap. Ex. iii. t. 238, A. B.; iv. t. 337, D. E. (1782).

*Argymnis phalanta*, Godt. Enc. Méth. ix. p. 259, n. 10 (1819).

*Phalanta columbina*, Horsf. Cat. Lep. Mus. E.I.C. t. 7, f. 5 (1829).

*Atella phalanta*, Horsf. & Moore, Cat. Lep. Mus. E.I.C. i. p. 152, t. 5, f. 7 (1857); Snellen, Tijd. Ent. xix. p. 149, n. 27 (1876); *ibid.* xx. p. 66 (1877); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 544, n. 1 (1877); Moore, Lep. Ceyl. i. p. 62, t. 31, f. 1, 1a (1881).

Male and Female. Wings above bright ochraceous, with the following blackish markings:—anterior wings with the apical half of the costal margin, four narrow waved fasciæ (arranged in pairs) crossing cell, a waved and broken spot beyond cell extending from costa to the lower discoidal nervule, an oblique series of four spots divided by the median nervules; a straight discal series of six spots placed between the nervules, followed by a similar series of four spots, the upper of which is placed between the discoidal

\* Cat. Lep. E. I. C. t. 7, f. 5, 5a.

† Moore's Lep. Ceylon, i. t. 31, f. 1a.

‡ The larvæ of *Pyrameis gonerilla*, a New Zealand species, are described by Mr. G. V. Hudson (Entomologist, vol. xvi. pp. 217-18) as exhibiting after the third and last moult “no less than four distinct varieties.”

nervules and the fourth between the second and third median nervules; a submarginal and much-waved fascia terminating at the third median nervule, where it is followed by an irregular spot, and which is more or less connected along the nervules with a marginal series of spots preceded by a narrow line; posterior wings with some transversely waved linear fasciæ on basal area; a discal series of four rounded spots, the two upper divided by the lower subcostal nervule, and the third and fourth by the second median nervule; two waved submarginal fasciæ, the innermost particularly waved and sinuated, and a marginal series of elongate spots. Wings beneath as above, but with most of the dark markings paler; anterior wings with the black spots near outer angle very large and prominent; the straight series of spots beyond cell are outwardly margined with greyish, and beyond this the wing has a violaceous suffusion; posterior wings with the outer central linear dark fascia reddish and outwardly margined with greyish, beyond which the colour has a violaceous tinge, and the black spots are very minute and surrounded with reddish. Body above somewhat concolorous with wings, beneath greyish; legs ochraceous, the femora greyish.

Exp. wings, ♂ and ♀, 55 to 58 millim.

HAB.—Continental India; N.W. Himalaya (Lang); Nepaul (Brit. Mus.); Saugor, Oudh, Calcutta, Bombay (Capt. de la Chaumette).—Burma, Moulmein (Brit. Mus.)—Ceylon (coll. Dist.)—Malay Peninsula; Penang, Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.)—Sumatra (Snellen).—Java (coll. Dist.); Batavia (Snellen).—Siam (Brit. Mus.)—China (Brit. Mus.).

A closely allied species is found in Africa, which, though very similar in the perfect condition, is described by Mr. Gooch, in Natal, as having the larva and pupa very different. This author also observes that “at some periods of the year the imago is much darker than at others”\*; a remark of pregnant importance when we see the specific subdivision going on around us, frequently based on such characters alone. It is a statement that may also explain the melanism of some specimens of *A. phalanta* in my own collection.

In the N.W. Himalaya, Capt. Lang found this species “tolerably abundant up to 8000 feet elevation”† whilst in the same area Mr. Hocking describes it as “found in the valleys.”‡ According to Capt. de la Chaumette, “its rapid flight makes it easily known; it does not bounce about like a true *Argynnis*, but it is very restless.”§ Mr. Hutchison states that in Ceylon it is “plentiful at Colombo, in gardens, during the S.W. Monsoon, and again towards the end of the year,”|| whilst Mr. Rothney found it common near Calcutta from early May to September.¶

The larva is figured (*ante*, p. 173), and is recorded by the previously quoted authors to feed in Ceylon and Continental India on *Flacourtia* and *Salix* sp., and in Java on *Ixora* sp.

## 2. *Atella alcippe*.



FIG. 46.—*Atella alcippe*, ♂.

*Papilio Alcippe*, Cram. Pap. Exot. iv. t. 389, f. G, H (1782).

*Argynnis Alciope*, Godt. Enc. Méth. ix. p. 259, n. 8 (1819).

*Atella alcippe*, Kirby, Syn. Cat. Diurn. Lep. p. 154, n. 2 (1871); Wood-Mas. and de Nic. J. A. S. Bengl. vol. xlix. p. 227, n. 12 (1880); *ibid.* vol. L, p. 232, n. 17 (1881).

Male. Smaller than *A. phalanta*, but resembling that species in colour and markings, though differing in the following particulars:—The anterior wings have the apical half of the costal margin more broadly

\* 'Entomologist,' vol. xiv. p. 3.

† Proc. Zool. Soc. 1865, p. 495.

‡ *Ibid.* 1882, p. 243.

§ Ent. Month. Mag. vol. ii. p. 37.

|| Moore's Lep. Ceyl. i. p. 62.

¶ Ent. Month. Mag. vol. xix. p. 34.

black; the outer margin also is broadly black, preceded by a contiguous waved fascia, which is deflected to costa at the lower discoidal nervule, thus enclosing two ochraceous spots; between these and end of cell the wing is crossed by a waved series of small spots placed between the nervules; the cell is crossed by three pairs of linear fasciæ, and is followed by a broader oblique fascia terminating at first median nervule, and beneath cell are four linear markings, two near base, the third longest and broken, the fourth smallest between the first and second median nervules. Posterior wings with a broad outer black margin, preceded by a narrower waved and sinuated submarginal fascia; outer discal spots as in *A. phalanta*, but the upper one very minute; on inner side of these and extending from about the extremities of the submarginal fascia is a narrow linear and somewhat broken fascia; other basal markings as in the preceding species, but more distinct. Wings beneath marked generally as above, but with corresponding differences as in *A. phalanta*.

Exp. wings, ♂ 44 to 46 millim.

HAB.—Continental India; Sylhet (coll. Moore).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.)—Nicobar Islands; Katschall (Wood-Mas. & de Nic.)—Burma; Tavoy (coll. Moore).—Malay Peninsula; Penang (coll. Gosse); Province Wellesley (coll. Dist.).

I am indebted to Mr. P. H. Gosse for the first intimation of this species occurring in our fauna, and his Penang specimen is here figured. I have since received it from Province Wellesley.

aa. *Outer margin of posterior wings prominently caudate.*

3. **Atella sinha.** (Tab. X., fig. 8 ♂.)

*Terinos Sinha*, Kollar, Hüg. Kaschm. iv. 2, p. 438 (1848).

*Atella Sinha*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 544, n. 2 (1877); Moore, Proc. Zool. Soc. 1878, p. 828.

Male. Anterior wings above ochraceous; a dark waved fascia commencing at costa beyond end of cell, concavely extending to first median nervule, and then obliquely deflexed beneath cell to near inner margin; within the fascia the colour is brownish, the cell being crossed by four narrow black fasciæ; the apex more or less suffused with blackish, either totally and enclosing some ochraceous spots, as in the specimen figured, or exhibiting two moderately well-defined oblique fasciæ; outer margin broadly blackish, preceded by a narrow submarginal line of the same colour, and with four small blackish spots, of which three—always visible—are placed two above and one beneath the second median nervule, and the fourth—sometimes fused in the apical coloration as in the specimen figured—situate between the discoidal nervules. Posterior wings of the same hue as the anterior, but with the outer third brownish, inwardly marked by a series of small dark spots placed between the nervules, and with broad marginal and submarginal dark fasciæ, between which the colour is narrowly pale ochraceous. Anterior wings beneath with the basal dark coloration more violaceous, the cell pale, but dark between the narrow black fasciæ, all the dark markings much paler, being brownish or violaceous, and with a series of distinct pale lunulate spots crossing the wing before the dark spots. Posterior wings beneath more or less violaceous, crossed by two central and much-waved narrow and darker fasciæ, between the upper portions of which the colour is pale ochraceous, and both of which are more or less outwardly margined with pearly greyish; a greyish subquadrate spot in cell margined on three of its sides with dark violaceous, the outer discal spots margined with rufous, but with the one above the first median nervule obsolete; outer margins pale, as on anterior wings. Body above concolorous with wings, beneath greyish or very pale ochraceous.

Exp. wings, ♂ 56 to 63 millim.

HAB.—Continental India; Nepal (Brit. Mus.)—Burma; Moulmein (Brit. Mus.)—Malay Peninsula; Penang (coll. Gosse).—Province Wellesley (colls. Dist. and Säuer); Malacca (Pinwill—Brit. Mus.)—Banca\*—Sumatra (Forbes—coll. Dist.).

\* Collected by M. Teysmann (Pet. Nouv. Ent. vi. p. 404 (1874)).

## Genus CUPHA.

- Cupha*, Billberg, Enum. Ins. p. 79 (1820); Scudd. Proc. Am. Acad. Arts & Sci. vol. x. p. 149 (1875);  
 Moore, Lep. Ceyl. i. p. 64 (1881).  
*Messaras*, Doub. Gen. Diurn. Lep. p. 163 (1848).

Wings rather short and broad. Anterior wings subtriangular, the costal margin very strongly arched and moderately convex, apex obtusely rounded, outer margin waved and obliquely rounded, inner margin somewhat concavely sinuated. Costal nervure extending to about centre of costal margin; first and second subcostal nervules short, the first emitted just before end of cell, the second about midway between bases of first and third, fourth and fifth bifurcating about midway between base of third and apex; the fourth somewhat bent near base. Lower disco-cellular nervule very slender and concavely oblique. Discoidal nervules emitted at about one-third from base of wing. First and second median nervules with an apparently common origin at end of the cell. Posterior wings broadly ovate; costal margin obliquely convex; outer margin rounded and waved; abdominal margin oblique to apex of internal nervure, and obliquely and somewhat concavely divergent to anal angle. Lower disco-cellular nervule obsolete, leaving the cell open. Body somewhat slender. Palpi raised above the upper level of the eyes, robust, thickly and finely pilose, the apical joint slender and somewhat pointed. Antennæ with a long and very gradually formed club.

This genus extends from Continental India throughout the Malay Peninsula, the Malayan Archipelago, and Papua, is found in Ceylon and the Andaman and Nicobar Islands, and as far north as China. *Cupha* is a genus of moderate specific capacity, about ten species being at present known to science.

1. *Cupha erymanthis*. (Tab. VIII., fig. 4 ♂.)

- Papilio Erymanthis*, Drury, Ill. Ex. Ent. i. t. 15, f. 3, 4 (1773); Cram. Pap. Ex. iii. t. 238, F, G (1782).  
*Argynnis Erymanthis*, Godt. Enc. Méth. ix. p. 257, n. 4 (1819).  
*Papilio Lotis*, Sulz. (nec. Cram.), Gesch. Ins. t. 16, f. 6 (1776).  
*Messaras erymanthis*, Druce, Proc. Zool. Soc. 1873, p. 342, n. 1; *ibid.* 1874, p. 10, n. 1; *Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 544, n. 1 (1877); Moore, Proc. Zool. Soc. 1878, p. 827; Snell. Tijds. Ent. xix. p. 150, n. 30 (1876).*

Male and Female. Wings above brownish ochraceous, with two irregular dark spots in cell, and two narrow waved dark lines at end of same; a broad and much waved and sinuated stramineous fascia a little beyond cell, which is inwardly margined with blackish, and beyond which the colour is wholly blackish containing a stramineous spot between the discoidal nervules, and a lineate spot between the second and third median nervules; in the pale fascia are two dark brownish spots separated by the second median nervule, and a larger quadrate spot beneath the third median nervule. Posterior wings with a narrow, black, strongly, and irregularly waved line crossing wing near apex of cell; this is followed by a straighter and broken linear fascia, outwardly margined with ochraceous, again succeeded by an outer discal row of spots placed between the nervules, two submarginal waved and broken fasciæ and a marginal fascia, all blackish. Abdominal margin greyish brown. Wings beneath as above, but pale ochraceous; anterior wings with the pale fascia much broader and beneath the first median nervule, widening to outer margin, where it contains a waved linear fascia before the dark spots; the apical area brownish, containing three pale spots beyond the pale fascia, and separated by the discoidal nervules, and two submarginal narrow waved dark linear fasciæ, which are broken, maculate, and elongate near apex; posterior wings with a distinct lunulate pale violaceous fascia before the black spots, which are more or less surrounded

with reddish, the black fasciæ above, pale brownish beneath. Body and legs more or less concolorous with wings.

Exp. wings, ♂ and ♀, 54 to 60 millim.

HAB.—Continental India; Dacca (Slater—Horsf. & Moore); Nepaul (Brit. Mus.)—Burma; Moulmein (Brit. Mus.)—Upper Tenasserim (Moore).—Malay Peninsula; Penang; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.)—Banca.\*—Java; Batavia (Snellen); Bantam (coll. Dist.)—Borneo (coll. Godm. & Salv.)—Siam; Chentaboon (Druce).—Formosa (Hobson—Brit. Mus.)—China (Brit. Mus.).

Of the habits of this abundant and widely spread species we know little. Capt. Slater remarks “tolerably plentiful at Dacca, 1844. Flies quietly, and is easily captured. I used to find one or two almost invariably near a deep pool of stagnant water overhung with bamboo, jungle, &c.” †

A variety ‡ of this species is found in the Nicobar and Andaman Islands, and another closely allied but darker form is found in Ceylon. §

### Genus CIRROCHROA.

*Cirrochroa*, Doubleday, Gen. Diurn. Lep. p. 157 (1848); Moore, Lep. Ceyl. i. p. 62 (1881).

Anterior wings subtriangular, either somewhat short and ample or apically prolonged; costal margin arched and convex, the apex rounded and in some species falcate, the outer margin more or less concave and waved, the inner margin moderately concavely sinuate. Costal nervure extending to about half the length of the costal margin; first subcostal nervule emitted at some little distance before the end of the cell, second at almost extremity of cell, third at a short distance before the bifurcation of the fourth and fifth, the fourth prominently bent and angulated. Disco-cellular nervules obliquely bent inwardly, the middle concave and about half the length of the lower; first and second median nervules with an apparently common origin a little beyond the base of the lower disco-cellular. Posterior wings ovate and elongate; costal margin moderately convex, the outer margin strongly waved; abdominal margin straight to apex of internal nervure and then concavely excavated to anal angle. Costal nervure reaching apex of wing; first subcostal nervule emitted opposite the base of third median nervule; lower disco-cellular nervule obsolete, leaving the cell entirely open; internal nervure strongly curved at base and slightly at apex. Body somewhat slender; palpi reaching the upper margin of the head, finely pilose, the apex slender and obtusely pointed; antennæ with a slender, long and gradually formed club.

In the posterior wings of the male there is a longitudinal broad impression between the discoidal and the first median nervules, somewhat concave above and convex beneath.

In some species, as the Indian *C. aoris*, || the sexes differ widely in appearance, the female being of a more obscure and duller colour above. This, however, is not the rule with the majority of the species of the genus.

\* Collected by M. Teysmann (Pet. Nouv. Ent. vi. p. 404 (1874).

† Horsf. & Moore, Cat. Lep. Mus. E.I.C. i. p. 151.

‡ *C. nicobarica*, Feld.

§ *C. placida*, Moore.

|| Prof. Westwood (Trans. Ent. Soc. 1880, p. 113, t. II) has described and figured two Gynandromorphous specimens of *C. aoris*, which exhibit in each specimen (either partially or completely) the colour markings of both sexes.

As Prof. Westwood has pointed out, “The term Gynandromorphism was first applied by M. Lacordaire to supersede in Entomology that of Hermaphroditism.” “In insects, gynandromorphous specimens partaking abnormally of the characters of both sexes, are generally bilateral; the sexual distinctive characters (which are for the most part in these instances the secondary ones) of one sex being exhibited on one side of the body and its organs, and the peculiarities of the opposite sex being seen on the other half of the insect.” This is called “complete” gynandromorphism; but other cases occur in which, “whilst the body of the insect appears to be unisexual, the partial sexual divarication is confined entirely to the secondary sexual characters.” Prof. Westwood observes that “the peculiar import of this strange modification in a physiological point of view is very difficult to be understood.”

*Cirrochroa* is somewhat widely distributed, for, beyond the range of the preceding genus, from India to the Papuan Islands, it is also represented in Australia.

1. *Cirrochroa orissa*. (Tab. X., fig. 9 ♀.)

*Cirrochroa orissa*, Felder, Wien. Ent. Mon. iv. p. 399, n. 19 (1860); Reise, Nov. Lep. iii. t. 49, f. 7, 8 (1866); Wall. Trans. Ent. Soc. 1869, p. 340; Druce, Proc. Zool. Soc. 1873, p. 342, n. 5; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 543, n. 1 (1877).

Male. Anterior wings above brownish-ochraceous with a broad transverse yellow fascia crossing wing at end of cell and the whole apical area black. Posterior wings brownish-ochraceous, with the following black markings:—a narrow, linear waved fascia crossing wing near end of cell and strongly angulated at third median nervule, followed by a row of spots placed between the nervules (absent between the discoidal and first median nervules) and a marginal and two submarginal much-waved fasciæ. Wings beneath paler; anterior wings with the central fascia whitish, containing a triangular brownish spot at inner margin; apical area brownish, with two long, ovate, contiguous greyish spots at apex, and an indistinct waved darker submarginal lineate fascia; posterior wings with the central black fascia above replaced by a broader pale violaceous fascia beneath, beyond which the colour is more or less shaded with violaceous, the black spots margined with reddish and two submarginal pale violaceous fasciæ. Body and legs more or less concolorous with wings.

Female. Resembling the male, but with the anterior wings above with a small subapical greyish streak, and beneath with the pale central fascia crossed by a narrow pale sinuated brownish fascia attached to the triangular spot at inner margin; the apical brown area also possesses an indistinct violaceous much-waved fascia.

Exp. wings, ♂ and ♀, 65 to 68 millim.

HAB.—Malay Peninsula; Penang (coll. Gosse); Province Wellesley (colls. Dist. and Säuer); Malacca (Pinwill—Brit. Mus.); Singapore (Wallace).—Borneo (Druce).

2. *Cirrochroa satellita*. (Tab. XIX., fig. 9 ♂.)

*Cirrochroa satellita*, Butler, Cist. Ent. i. p. 9 (1869); Lep. Exot. p. 103, t. 38, f. 7 (1872); Druce, Proc. Zool. Soc. 1873, p. 342, n. 4.

Male. Wings above brownish-ochraceous, both wings crossed a little beyond cells by a broad bright ochraceous fascia, after which the wings are blackish; the pale fascia of posterior wings contains an incomplete series of black spots placed between the nervules—that at anal angle largest—and two narrow, waved, black submarginal fasciæ, the outer of which, above the median nervules, is blended with the posterior black area. Wings beneath paler, the black areas brownish, the central pale fasciæ containing at their inner margins a narrower greyish fascia, widest on anterior wings, where it is also more ochraceous; anterior wings with a submarginal, lunately macular, violaceous fascia, beyond which is a straighter and more distinct pale fascia; posterior wings with a macular violaceous fascia as on anterior wings, followed by two dark, narrow waved fasciæ, the series of black spots larger and more continuous. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 55 to 58 millim.

HAB.—Malay Peninsula; Perak (Dr. Townsend—coll. Godm. & Salv.)—Borneo (Druce); Sandakan Pryer—coll. Dist.)—China; Hong Kong (coll. Godm. & Salv.).

This does not appear to be an abundant species, at least so judging from present collections, and is slightly variable in the number of black spots visible on the upper surface of the posterior wings.

The specimen figured was collected in Perak by Dr. Townsend.



### 3. *Cirrochroa clagia*. (Tab. XVII., fig. 7 ♂.)

*Argynnis Clagia*, Godart, Enc. Méth. ix. Suppl. p. 816 (1823); Boisd. Spec. Gén. i. t. 10, f. 6 (1836); Snell. Tijd. Ent. xx. p. 66 (1877).

Male. Wings above reddish-ochraceous, both wings with a broad outer marginal blackish fascia, which on anterior wings is recurved and broadest at apical angle, these blackish areas possess two indistinct narrow dark submarginal fasciæ and that on posterior wings is either preceded or inwardly margined by a series of black spots placed between the nervules; a very narrow and non-continuous blackish fascia also crosses the posterior wings a little beyond cell, which at costal margin has an adjacent greyish spot. Wings beneath much paler, crossed by a greyish fascia, as in preceding species, which is margined with reddish ochraceous, and beyond which their area is distinctly darker and somewhat tinged with violaceous, containing the narrow submarginal fasciæ as in *C. satellita*; the anterior wings have a greyish subapical spot, and the cell centrally crossed by a sinuated dull reddish line, which is continued beneath the median nervure, the lower disco-cellular nervule being similarly coloured; the posterior wings have the black spots margined with reddish, and the cell crossed by a sinuated dull reddish line, which extends from near the costal margin to near the submedian nervure. Body and legs more or less concolorous with wings; the femora, sternum, and abdomen beneath greyish.

Female. Differs from the male above by having distinct traces of a central broad yellowish fascia on the anterior wings; the posterior wings having the outer black area narrower, leaving the two narrow waved fasciæ very distinct, the spots thereby appearing further removed.

Exp. wings, ♂ and ♀, 63 millim.

HAB.—Malay Peninsula; Singapore (Brit. Mus.)—Sumatra (Forbes—coll. Dist.)—Java (Wallace).

The principal variation in the forms of this species appears to consist in the breadth of the outer black margin to the posterior wings, and the thereby sometime consequent assimilation or fusion of the black spots.

### 4. *Cirrochroa bajadeta*. (Tab. XIX., fig. 1 ♂ and 2 ♀.)

*Cirrochroa bajadeta*, Moore (Horsf. & Moore), Cat. Lep. Mus. E.I.C. i. p. 150, n. 309, t. 3a, f. 3 (1857); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 543, n. 3 (1877).

*Cirrochroa ravana*, Moore (Horsf. & Moore), Cat. Lep. Mus. E.I.C. i. p. 150, n. 310 (1857).

*Cirrochroa malaya*, Druce (nec. Feld.), Proc. Zool. Soc. 1873, p. 342, n. 1.

Male. Wings above reddish-ochraceous. Anterior wings, with the costa, a narrow transverse fascia near end of cell, and the outer margin—very broad at apex—black; beyond the cell the colour is somewhat paler, giving the appearance of a broad transverse fascia; and a small ochraceous subapical spot. Posterior wings with the outer area from end of cell paler, its inner area marked on each side of the submedian nervure with a lunate black linear spot, and by a similar spot above the upper subcostal nervule; an irregular series of small black spots placed between the nervules (absent between the first median and the discoidal nervules), and three waved submarginal black fasciæ, the outer one more or less fused with the dark outer margin. Wings beneath paler in hue. Anterior wings with the cell crossed by two linear darker fasciæ, one at its termination, the other beyond centre and extending beneath the median nervure; a somewhat violaceous area crossing wing beyond cell, broad at costa and very narrow and attenuated at inner margin; apex obscurely infuscated, and containing two subapical greyish white spots and a marginal waved fascia, the edges of which are distinctly pale fuscous; beneath the third median nervule and in front of the pale fascia is an irregularly formed fuscous spot. Posterior wings crossed by a narrow and very pale violaceous fascia, which is distinctly narrowed and attenuated between the upper subcostal and the discoidal nervules;

black spots as above, but margined with reddish-ochraceous; marginal and submarginal fasciæ as on anterior wings. Body and legs more or less concolorous with wings.

Female. Wings above as in male, with the pale area better defined and inwardly but narrowly margined with blackish; beneath with the central fasciæ paler.

Exp. wings, ♂ and ♀, 65 to 75 millim.

HAB.—Malay Peninsula; Penang (coll. Gosse); Province Wellesley (colls. Dist. and Sauer); Malacca (Pinwill—Brit. Mus.)—Borneo; Labuan (coll. Dist.); Sandakan (Pryer—coll. Dist.)—Java (Horsf. & Moore and coll. Dist.).

The female of this species appears to have been described by Mr. Moore under the name of *C. ravana*, but having received both sexes from Java, Borneo, and the Malay Peninsula, I feel no doubt as to its sexual relation to *C. bajadeta*.

5. *Cirrochroa malaya*. (Tab. X., fig. 4 ♂ and 3 ♀.)

*Cirrochroa Malaya*, Felder, Wien. Ent. Mon. iv. p. 399, n. 18 (1860).

*Cirrochroa Johannes*, Butler, Proc. Zool. Soc. 1868, p. 221, t. 17, f. 10; \* Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 543, n. 2 (1877).

*Cirrochroa bajadeta*, Moore, var. ?

Male and Female. Resembling the corresponding sexes of *C. bajadeta*, but with the pale violaceous fascia crossing the under surface of the posterior wings entire and not attenuated at the subcostal and discoidal nervules as in that species; the under surface of both wings is also generally rather darker and more violaceous than in *C. bajadeta*.

Exp. wings, ♂ and ♀, 63 to 70 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.).

The figure of the male which is here given represents a specimen taken by Capt. Pinwill in Malacca, and now contained in the British Museum, being a somewhat pale form of the species. Both Mr. Butler† and Mr. Kirby‡ incline to the opinion that the *C. malaya*, Feld., is more or less synonymous with the preceding species, and the reasons why I have differed from these authorities and identified it with *C. johannes* are contained in Felder's diagnosis. Thus the description of the under surface of the wings as "lilacino suffusus," and the pale fascia to the posterior wings as "angusta recta," thoroughly applies to the species figured and described by Mr. Butler, and the last character especially, in contradiction to the suddenly or attenuated fascia in the other species. Felder naturally compared it to *C. bajadeta*, *C. johannes* not having been then described, and the fact of his having thus compared it would naturally lead to the supposition that he must have been cognisant of Mr. Moore's species.

I am inclined, however, to the view that specimens will be obtained of a completely intermediate character between *C. bajadeta* and *C. malaya*.

\* This figure, without a doubt, has been rendered much too highly coloured, a *contretemps* which few authors have not had occasion to deplore from the hands of the colourist.

† Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 543.

‡ Syn. Cat. Diurn. Lep. p. 152.

6. *Cirrochroa rotundata*. (Tab. X., fig. 10 ♀.)

*Cirrochroa rotundata*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 543, n. 4 (1877).

This species being only known to me by Mr. Butler's description and the type specimen in the British Museum, I have here figured the last, and give a copy of the former, as follows:—

“♀. Nearly allied to *C. mithila*, Moore,\* the wings more rounded, primaries less produced; markings of primaries above almost obsolete; outer undulated line of secondaries much less distinct; below all the bands and spots tawny, instead of ochre-yellow.”

“Expanse of wings, 2 inches 11 lines.”

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).

This species is evidently closely allied to Mr. Moore's species, which I have not seen. Mr. Butler remarks, “I have no doubt that this species is distinct from *C. mithila*; the coloration of the bands below is strikingly different.”

## Genus TERINOS.

*Terinos*, Boisduval, Sp. Gén. i. t. 9, f. 4 (1836); Doubl. Gen. Diurn. Lep. p. 159 (1848).

Anterior wings moderately long, the costal margin strongly arched and convexly depressed at apex, the apex more or less broadly falcate, beneath which the outer margin is concavely sinuated and waved; inner margin sinuate, concave near centre. Costal nervure not quite reaching the centre of costal margin; first subcostal nervule emitted a little before the end of cell, and the second nervule at the apex of cell; third emitted at about two-thirds of the space between the base of the second and the bifurcation of the fourth and fifth, the fourth being distinctly bent and angulated; upper disco-cellular nervule minute, middle disco-cellular obliquely directed inwardly and somewhat concave, lower disco-cellular rather more than twice as long as the middle, strongly oblique and prominently recurved and rounded at base; second median nervule emitted near the base of the lower disco-cellular nervule, the base of the upper median nervule convexly rounded. Posterior wings more or less subquadrate, the costal margin oblique and slightly convex; outer margin waved, slightly convex to apex of first median nervule, where it is sometimes prominently caudate and then somewhat truncate to anal angle; abdominal margin excavated from about apex of internal nervure to anal angle. Costal nervure prominently arched and rounded at base, and extending to apex; second subcostal nervule emitted nearer to first than first is from the base of subcostal nervure; lower disco-cellular nervule present, very slender, somewhat atrophied and transversely concave. Thorax somewhat robust; abdomen moderately slender. Antennæ only of moderate length, but abruptly clavate at apices; palpi raised above the upper level of the head.

The males possess a glossy velvety patch on both wings, large and discal on anterior wings, and small and apical on posterior wings. Judging from my own experience the females appear to be excessively rare, or, as is possible, a difference in their habits may be the cause of their very infrequent capture.

The genus is of moderate extent—comprising some nine or ten species—and peculiarly Malayan in distribution. I am cognisant of no species from Continental India, nor have such

\* A species described as from Bengal.

been recorded from Ceylon, the Andaman or Nicobar Islands; but from the Malay Peninsula, *Terinos* extends eastwards through the Malayan Archipelago to New Guinea.

Two species are here figured and described, both of which appear to be confined to this fauna. Another proposed species, described from Singapore\* (*T. viola*, Wall.), I take to be synonymic with the second here enumerated.

a. *Posterior wings not caudate.*

1. *Terinos robertsia*. (Tab. X., fig. 7 ♂.)

*Terinos Robertsia*, Butler, Ann. & Mag. Nat. Hist. ser. 3, vol. xx. p. 400, t. 8, f. 2—4 (1867); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 544, n. 2 (1877); Wall. Trans. Ent. Soc. 1869, p. 342.

Male. Wings above dark violaceous; anterior wings with a large dark brownish silky patch, which occupies about apical half of wing, but not extending above the discoidal nervules, except at outer margin, where it is continued to apex, it also extends along inner margin to base; posterior wings with a similar but smaller silky patch broadly occupying apex and extending from costal margin to the lower subcostal nervule; two large white submarginal spots separated by the upper median nervule and a third almost obsolete spot between the second and third median nervules; narrow waved darker marginal and submarginal fasciæ; fringe greyish. Wings beneath of a steely-bluish colour, crossed by a number of dull reddish fasciæ, of which five narrow and much waved cross both wings from base to a little beyond cell; these are followed by a broader and less waved fascia, which on anterior wings is succeeded by a macular fascia, of which the upper spots are outwardly pointed, and one marginal and two narrow submarginal fasciæ which become fused at apex, and there contain a small white spot placed between the fourth and fifth subcostal nervules; on posterior wings the central broad fascia is followed by one broader and more irregular, which contains a series of castaneous spots placed between the nervules, one marginal and two submarginal fasciæ, between which the colour is greyish-white, and the inner one of which is waved and at about centre dentate, thus enclosing some apparently large angulated greyish-white spots. Body above concolorous with wings; beneath, with the femora, greyish; tibiæ and tarsi ochraceous.

Female. I only know this sex by the description and figure of Mr. Butler. His diagnosis is as follows:—"Alæ supra fuscæ; area basali maculis sex anticis discalibus inæqualibus inter venas positis plagaque posticis discali purpureis nitidis; anticæ fasciis duabus obseurioribus æquidistantibus fuscis transversalibus: posticæ maculis albis velut in mari, lunulisque alteris contiguis marginalibus albidis."

Exp. wings, ♂ and ♀ 63 to 73 millim.

HAB.—Malay Peninsula; Penang; Province Wellesley (colls. Dist. and Sauer); Perak (Townsend—coll. Dist.); Malacca (Pinwill—Brit. Mus.): Ayerpanas (coll. Roberts); Singapore (Wallace).

Although I have captured, received, and examined a large number of the males of this species, I have not as yet seen a female specimen. Judging from Mr. Butler's figure, it is rendered very distinct from the other sex by the possession of a broad central dark fascia on the upper surface of both wings.

\* I have recently received a kindly worded remonstrance from Calcutta, that I have not included some species which have by more than one author been ascribed to the fauna of Singapore. My reply must be the following:—There is little doubt, that formerly, and before the biological value of an exact habitat was appreciated, much geographical error was recorded on faulty or hasty information. Many insects collected in Borneo and sent home from Singapore have had the last locality asserted as their habitat, and it becomes necessary, in the absence of specimens from that island, to require some corroborative testimony. The insertion of an erroneous species in a fauna is calculated to do infinitely more harm to biological science than the non-insertion of a true but unproved member of that fauna.

b. *Posterior wings prominently caudate.*

2. **Terinos teuthras.** (Tab. X., fig. 6 ♂.)

*Terinos Teuthras*, Hewitson, Proc. Zool. Soc. 1862, p. 89; Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 544, n. 1 (1877).

*Terinos viola*, Wall. Trans. Ent. Soc. 1869, p. 343.

Male. Wings above dark violaceous; anterior wings with a large dark brownish silky patch as in preceding species, but which extends a little above the upper discoidal nervule and inwardly to the lower disco-cellular nervule; posterior wings with a similar patch near apex, which does not extend to the outer margin, and is continued to between the lower subcostal and the discoidal nervules; some large marginal conical whitish spots about centre of outer margin, through which extends a waved dark violaceous submarginal fascia; a dark marginal fascia and the fringe greyish. Wings beneath brownish, with steely reflections; anterior wings with the cell crossed by two narrow waved reddish fasciæ, beyond which is a similar very broad and marginally waved fascia crossing both wings; this is also succeeded on both wings by a narrow bluish lunulate line, which on posterior wings is placed in front of some reddish spots situate between the nervules; the anterior wings possess a pale apical patch enclosing a dark spot and a pale submarginal fascia; the posterior wings have an ochraceous much-waved submarginal fascia, on each side of which the colour is pale bluish. Body more or less concolorous with wings; legs ochraceous.

Long., ♂, 80 to 90 millim.

HAB.—Malay Peninsula; Penang (coll. Gosse); Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Brit. Mus.).

I have not yet seen a female specimen of this species, which is apparently confined to the Malay Peninsula, for though Mr. Hewitson described it as from "India," that vague term in all probability is really applicable to some portion of this area.

I have included the *T. viola*, Wall., as a synonym of this species, to which the description exactly applies, and though Mr. Wallace refers to it he evidently was ignorant of its nature and localises it with doubt to "East India." Mr. Kirby\* treats *T. viola* as a synonym of *T. terpander*, Hew. (= *T. clarissa*, Doub., Hew. nec Boisd.), † but the colour of the margin to the posterior wings will effectually prevent any confusion.

Genus CYNTHIA.

*Cynthia*, Fabricius, Ill. Mag. vi. p. 281 (1807); Doubl. Gen. Diurn. Lep. p. 212 (1849); Moore, Lep. Ceyl. i. p. 52 (1881).

*Anartia* (part), Hübn. Verz. bek. Schmett. p. 33 (1816).

Anterior wings subtriangular; costal margin arched and convex; apex rounded and somewhat falcately produced, beneath which the outer margin is concavely sinuated and waved; inner margin sinuated, somewhat concave at centre. Costal nervure extending to rather beyond centre of costal margin; first subcostal nervule emitted a little before and second just beyond end of cell, third emitted a little before the bifurcation of the fourth and fifth, the fourth distinctly and convexly bent. Upper discoidal nervule short and oblique, the middle disco-cellular concave and about half the length of the lower, which is obliquely concave; median nervules well separated, the second emitted a short distance

\* Syn. Cat. Diurn. Lep. p. 151.

† Gen. Diurn. Lep. t. 21, f. 3.

before the base of the lower disco-cellular nervule. Posterior wings somewhat subquadrate; costal margin moderately oblique and convex; posterior margin waved and caudately produced at apex of upper median nervule; abdominal margin as in preceding genus; precostal nervure suberect and then suddenly bent and obliquely directed outwardly; costal nervure strongly arched and extending to apex; second subcostal nervule emitted at about the same (or a little less) distance from the first as the base of that nervule is distant from the subcostal nervure; lower disco-cellular nervule obsolete, leaving the cell entirely open; upper median nervule angulated at a short distance from base. Body robust; abdomen short; palpi raised above the upper level of the head; antennæ long, their apices prominently clavate, forming short clubs.

*Cynthia* is found in Continental India, Ceylon, and the Andaman Islands, but has not been recorded from the Nicobars; from Burma and the Malay Peninsula it extends throughout the Malayan Archipelago, and has been discovered as far eastward as New Britain.

The genus is only of moderate extent, though much larger than formerly understood, when one or two species were considered as alone found throughout its area. Since that time many females have been discovered, which have corroborated the view of much greater and distinct racial or specific segregation.

### 1. *Cynthia deione*. (Tab. X., figs. 1 ♂, 2 ♀.)

*Cynthia Deione*, Erichson, Nova Acta Ac. Nat. Cur. xvi. Suppl. p. (279) 403, n. 3, t. 50, f. 2, 2a (1833); Hopff. Stett. Ent. Zeit. xxxv. p. 35, n. 83 (1874); Godm. & Salv. Proc. Zool. Soc. 1878, p. 639, n. 15.

*Cynthia arsinöe*, Druce (nec Cram.) Proc. Zool. Soc. 1873, p. 342, n. 1.

*Cynthia erotella*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 544, n. 1 (1877).

Male. Wings above pale reddish-ochraceous. Anterior wings with the cell crossed by two narrow black fasciæ at centre, a similar waved fascia near end, and two slender and contiguous lines at its termination, enclosing the disco-cellular nervules; an oblique narrow black discal fascia crossing wing beyond apex of cell, after which is a strongly waved fascia, distinct and blackish above the upper median nervule, indistinct and reddish beneath it; a submarginal series of black spots placed between the nervules, and becoming obsolete towards the apex (which is somewhat infuscated) and outer angle, two narrow waved submarginal black fasciæ and the margin of the same colour. Posterior wings with a narrow oblique central fascia, which is either pale fuscous or reddish as in the specimen here figured; two ocellated spots, one between the second and third median nervules, the other above the discoidal nervule; an irregular black spot at apex, and marginal and submarginal lines as on anterior wing, the inner of which is straight and truncate at median nervules; from the area of the ocellated spots to the posterior margin the colour is distinctly darker. Wings beneath paler and marked as above; anterior wings with three whitish and tale-like apical spots; posterior wings with some transverse linear markings near base, and an elongated spot surrounding the upper disco-cellular nervule; beyond the central transverse fascia on both wings the colour is less rufous, and on posterior wings an oblique dark fascia precedes the ocellated spots. Body\* and legs concolorous with wings.

Female. Wings above olivaceous, marked as in male, but with a whitish central fascia crossing both wings; anterior wings with distinct white apical spots, and posterior wings with an additional ocellated and bi-pupillated spot at anal angle. Wings beneath as above, but much paler; posterior wings with the dark fascia preceding the ocellated spots, as in the same wings of the male.

Exp. wings, ♂ 75 to 80 millim.; ♀ (one spec.) 93 millim.

\* In the specimen figured the thorax is rubbed and denuded, thus giving it a black appearance.

HAB.—Malay Peninsula; Penang; Province Wellesley (colls. Dist. and Saüer); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.)—Banca.\*—Billiton (Godm. and Salv.)—Sumatra (Forbes—coll. Dist.)—Java (coll. Godm. & Salv.)—Borneo (coll. Dist.); Labuan (Collingwood).—Celebes (Hopffer).—Philippines (coll. Godm. & Salv.); Luzon (Erichson).

In Labuan Mr. Collingwood observed this species frequenting a “patch of sandy sea-shore,” and he remarks that when alighting upon it, “although it matched the sand well in colour, it was not difficult to secure.”† Its habits, however, are not exclusively littoral, and it seems generally distributed over the areas in which it is found.

## 2. *Cynthia cantori*. ‡ (Tab. X., fig. 5 ♂.)

*Cynthia Cantori*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. x., p. 406 (1882).

Male. Closely allied in colour and markings to the preceding species, *C. deione*, Erichs., from which it differs above on the anterior wings by the more angulated markings in the cell, and by the central transverse fuscous fascia being placed much nearer to the apex of cell, whilst on the posterior wings this fascia is seen to be *abruptly broken and deflected near the bases of the first and second median nervules*; on the under surface this fracture or angulation appears much more distinctly; the basal curved line which crosses the cell in *C. deione* is also broken and looped in *C. cantori*.

Exp. wings, ♂ 68 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.).

I have not as yet received a second specimen of this species, nor have I seen its female, which will, however, almost certainly prove to be somewhat like the female of *C. deione*, with the difference of marking detailed above as found in the other sex.

## Fam. ERYCINIDÆ. §

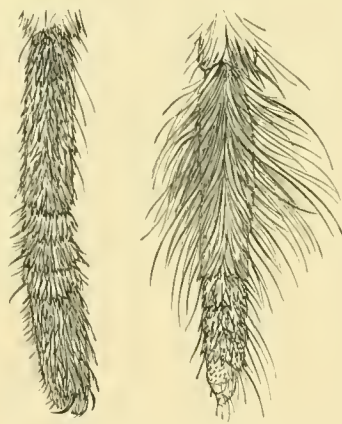
*Erycinidæ*, Swainson, Phil. Mag. ser. 2, vol. i. p. 187 (1827); Westwood, Gen. Diurn. Lep. p. 415 (1851); Bates, Journ. Entomol. vol. i. p. 220 (1861); ib. vol. ii. p. 176 (1864).

*Lemoniidæ*, Kirby, Cat. Diurn. Lep. p. 282 (1871); Moore, Lep. Ceyl. i. p. 67 (1881); Marsh. & De Nic. Butt. Ind. Burm. & Ceyl. vol. i. p. 18 (1882).

*Erycina*, Snellen, Lep. v. Midden-Sumatra, p. 20 (Leiden, 1880).

Front legs perfect in the female, in the male imperfect, the tarsi consisting of one or two joints only, and spineless.

Pupa either suspended freely by the tail, as in the Subfam.



♀ ♂  
FIG. 47.—Anterior legs (showing tarsi) of *Abisara kausambi*.

\* Collected by M. Teysmann (Pet. Nouv. Ent. 1874, p. 404).

† ‘Rambles of a Naturalist,’ p. 183.

‡ This species is named after the late Dr. Cantor, the well-known Malayan zoologist, whose catalogues of the mammals, reptiles, and fishes belonging to the Malay Peninsula and Islands were some of the first real contributions to a knowledge of the fauna.

§ The name of this family was founded on that of *Erycina*, proposed by Fabricius in 1807 for a genus of Rhopalocera, but previously used by Lamarek in 1805 for a genus of Mollusks. The generic name, therefore, as far as Rhopalocera is concerned, is preoccupied and falls. The question now arises whether the family name should stand, founded on a generic name not rightfully appertaining to the Insecta? The decision arrived at here, in favour of that course, is based on the desire for uniformity, and the uncertain way in which the two names have been used by the authors enumerated above in connection with the name *Lemoniidæ*. Thus Mr. Kirby founded the name (*supra*), but in his lepidopteral contribution to our ‘Zoological Record’ he reverts to that of “*Erycinidæ*.” Mr. Moore uses the name “*Lemoniidæ*” in 1881 (*supra*), but in the following year (Proc. Zool. Soc. 1882, p. 243) he substitutes that of “*Erycinidæ*,” whilst though Mr. de Niceville, in association with Mr. Wood-Mason (J. A. S. Bengl. vol. li. pt. 11, p. 16 (1882), uses the last-mentioned name, in the same year, associated with Major Marshall (*supra*), he advocates that of *Lemoniidæ*.

*Libythæine*,\* or recumbent on a leaf or other object, and secured by the tail and a girdle across the middle, as in the Subfam. *Nemeobiinæ*.

It is not, however, in the Eastern, but in the Western Tropics that the *Erycinidæ* reach their maximum in number and beauty, and like the *Morphina* may be said to bear witness in the Oriental region to an earlier Neotropical relationship, the truth of which will be probably demonstrated by future palæontological discoveries.

In the Neotropical region the *Erycinidæ* exhibit, as truly remarked by Mr. Wallace, "a variety and brilliancy of colouring unsurpassed in the whole order"; and the same author and observer recorded that in that region "the great mass of the species of this family have a very peculiar habit of invariably settling and reposing on the under surface of leaves with the wings expanded, but there are some very striking exceptions to the rule."† Mr. Bates describes these exceptions when he records that in many genera, "on the contrary, the position of the wings in repose is vertical; and a few species settle on the upper surface of leaves with the wings half elevated."‡ It will therefore be most interesting to learn whether these peculiarities are observable in the Eastern representatives of the family.§

#### Subfam. NEMEOBINÆ.

*Nemeobiina*, Bates, Journ. Linn. Soc. Zool. vol. ix. p. 412 (1867-1868); Marsh. & de Nic. Butt. India, Burm. & Ceyl. p. 18 (1882).



FIG. 48.—Pupa of *Abisara prunosa*.  
(From Moore's Lep. Ceyl.)

In this subfamily the palpi are very small and slender, a character which will sufficiently separate the *Nemeobiinæ* from the *Libythæinæ*, which, as before remarked, is almost certainly represented in this fauna, though at present unrecorded.

From the other divisions of the *Erycinidæ*, the *Nemeobiinæ* may be separated by a feature in the neuration of the anterior wings, in which the subcostal nervure emits five nervules.||

Although this subfamily contains all the old world species of *Erycinidæ*, it also includes a large number belonging to the Neotropical region.

\* No example of this subfamily, to my knowledge, has yet been received from the Malay Peninsula, though it almost certainly must be there represented.

† Trans. Ent. Soc. 1853, p. 262.

‡ Journ. Linn. Soc., Zool. vol. ix. p. 369 (1868). This variable method of bearing the wings in repose has induced Mon. Constant Bar (Ann. Soc. Ent. Fr. ser. 5, t. viii. p. 17 (1878) to place the *Erycinidæ* in systematic juxtaposition with the *Hesperidæ*, whose similar variability in the same function has already been alluded to on the first page of this work.

§ The gradual, though recent, growth of our knowledge in exotic Rhopalocera is afforded by some statistics given by Mr. Bates (Journ. Linn. Soc., Zool. vol. ix. p. 368), "In 1819, when Godart treated of the group, as one genus, in the 'Encyclopédie Méthodique,' only 134 species were described; and in 1851 Prof. Westwood could muster only 247." At the date of reading his paper (1867) Mr. Bates stated that the number of described species was not fewer than 630, of which a large number were discovered by himself, whilst, at the end of 1877, or ten years subsequently, I have computed (by the aid of Mr. Kirby's excellent Catalogue) that, excluding the *Libythæinæ*, some 900 species were described.

|| Mr. Bates gives these nervules or "branches" as four, thus evidently, in agreement with some other entomologists, preferring to consider what is here designated as the fifth nervule as being actually the termination of the subcostal nervure.





FIG. 49.—Post. wing of *Zemeroides*, showing position of lower disco-cellular nervule.



FIG. 50.—Post. wing of *Abisara kausambi*, showing position of lower disco-cellular nervule.

### SYNOPSIS OF GENERA.

1. Lower disco-cellular nervule of posterior wings united with the common base of the two upper median nervules. . . . . ZEMEROS.
2. Lower disco-cellular nervule of posterior wings united with the upper median nervule at some little distance from its base.
  - a. Upper and lower disco-cellular nervules of posterior wings about equal in length. . . . . ABISARA.
  - aa. Lower disco-cellular nervule of posterior wings much longer than the upper.\* . . . . STIBOGES.

### Genus ZEMEROS.

*Zemeroides*, Boisduval, Sp. Gén. i. t. 21, f. 5 (1836); Westw. Gen. Diurn. Lep. p. 418 (1851).

Anterior wings somewhat triangular; costal margin nearly straight, but slightly convex, outer margin more or less convex, inner margin slightly amplified and convex. Costal nervule robust, and terminating near centre of costal margin; first and second subcostal nervules emitted before and near the termination of the cell; third about midway between the end of cell and bifurcation of the fourth and fifth nervules; disco-cellular nervules irregularly concave, the lower uniting with the upper median nervule near its base. Posterior wings irregular in shape, the outer margin being either convexly rounded or waved and strongly angulated near the upper median nervule, the costal margin nearly straight or very slightly convex. Precostal nervule strongly curved outwardly; costal nervule very short; subcostal nervules bifurcating at upper extremity of cell; lower disco-cellular nervule a little longer than the upper and united with the common base of the two upper median nervules. Head small, with a frontal tuft of hairs; palpi minute, not visible above; antennæ somewhat short (narrowly annulated with white in all the species examined), and terminating in a distinct club.

This is a small genus, and inhabits North-Eastern India and the Indo-Malayan region; but has neither been recorded from Ceylon, nor the Andaman or Nicobar Islands.

If we admit all the described forms as reaching the artificial canonicity of "species," then it may be stated that about four species are known, though their amount of diversity is very unequal.

#### 1. *Zemeroides albipunctata*. (Tab. XVIII., fig. 12 ♀.)

*Zemeroides albipunctata*, Butler, Cist. Ent. vol. i. p. 236 (1874); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 2, t. lxxix, f. 10 (1877).

Male and Female. Wings above reddish ochraceous or reddish-brown. Anterior wings with the following black spots:—two crossing cell, one beneath cell near base, a curved series of five commencing immediately beyond cell and directed inwardly, followed by a similarly curved series of seven spots, the uppermost minute, and the lower two situate between the third median nervule and the submedian nervule; beyond these are a series of seven white spots, of which the four uppermost are largest and most distinct, and a submarginal series of seven linear black spots outwardly containing a small white spot; fringe alternately black and greyish. Posterior wings with the disk more or less covered with similarly sized and shaped black spots as on anterior wings, and also with a submarginal series of spots and the fringe as on those wings. Wings beneath a little paler than above, the black spots somewhat more

\* Taken from Mr. Butler's description, as I have been unable to examine a specimen belonging to the genus.

indistinct and the white spots brighter and more emphasized than above, the posterior wings possessing traces of an inner series of small white spots on anterior area. Body and legs more or less concolorous with wings; antennæ fuscous, narrowly annulated with greyish, their apices pale ochraceous.

Exp. wings, ♂ and ♀, 35 to 40 millim.

HAB.—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus. and Biggs—coll. Dist.); Ayerpanas (coll. Roberts).—Sumatra (Forbes—coll. Dist.)—Borneo (Brit. Mus.).

The specimen figured is a somewhat pale variety of the species, which is generally more melanic in hue. It is also closely allied to *Z. flegyas*, Cram., from which it appears to be distinct.\* It is singular, however, that Cramer's species is found both in N.E. India, Upper Tenasserim, and Java, but apparently replaced by *Z. albipunctata* in Borneo, Sumatra, and the Malay Peninsula, though similar peculiarities of distribution have been pointed out by Wallace, both in birds and mammals.

## 2. *Zemerus emesoides*. (Tab. XVIII., figs. 3 ♂, and 4 ♀.)

*Zemerus emesoides*, Felder, Wien, Ent. Mon. iv. p. 396, n. 10 (1860); Reise Nov. Lep. ii. p. 289, n. 373, t. 36, f. 9–11 (1865); Druce, Proc. Zool. Soc. 1873, p. 347, n. 1.

Male. Wings above reddish-ochraceous, and crossed by four broad dark fasciæ, the outer one strongly curved and followed by a submarginal narrow waved fascia of the same colour, the fringe also fuscous; the anterior wings possess a short basal oblique fascia extending partly through cell and the posterior wings have also a minute and obscure basal fascia. Wings beneath as above, but paler. Body and legs more or less concolorous with wings. Antennæ fuscous, narrowly and obscurely annulated with greyish, but more distinctly so beneath than above, their apices pale ochraceous.

Female. Paler in hue than the male, and with the submarginal fasciæ a little broader.

Exp. wings, ♂ and ♀, 33 to 39 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Castelnau—coll. Feld.; Pinwill—Brit. Mus.; Biggs—coll. Dist.)—Borneo (Druce).

Felder's descriptions were taken from specimens collected in the interior of Malacca by the Com. de Castelnau, and the species, like the preceding, is probably distributed throughout the Malay Peninsula, Sumatra, and Borneo.

## Genus ABISARA.

*Abisara*, Felder, Wien, Ent. Mon. iv. p. 397 (1860); Moore, Lep. Ceyl. vol. i. p. 68 (1881).

*Sospita*, Hew. Ex. Butt. ii. Sosp. t. 1 (1861).

Subgen. *Larita*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 546, n. 4 (1877).

Anterior wings subtriangular; costal margin either arched from base and then somewhat straight to apex, which is somewhat angularly pointed, or convex to apex, which is rounded; outer margin obliquely straight or slightly convex; inner margin slightly or prominently convex near base. First and second subcostal nervules short, emitted a little before the end of the cell; third emitted about midway between the end of cell and bifurcation of the fourth and fifth nervules, or a little nearer to the last than to apex of cell, cell very broad; disco-cellular nervules concavely bent, lower disco-cellular joining

\* In formulating opinions as to whether closely allied forms are distinct species, when our material is that of the perfect insect alone, it must always be granted that such conclusions are purely empirical. The life-history of the insect may disclose a different tale, as when, in some British moths, the perfect insects are almost inseparable and the larval characters specifically divergent, or *vice versa*; or again, as has been recently shown, very different forms may simply represent different *seasonal* or *dimorphic* phases of one species.

upper median at a short distance from base. Posterior wings subovate; costal margin convex at base and thence oblique to apex; posterior margin either prominently angulated at apex of the upper median nervule or regularly rounded and slightly waved. Costal nervure very short; precostal nervure curved outwardly; subcostal nervules bifurcating beyond the end of the cell; upper and lower disco-cellular nervules about equal in length, the lower joining the upper median nervule at a short distance from its base. Body somewhat small; palpi minute, not visible above; antennæ slender, with a distinct spatulate club.

Little has been recorded relating to the life-history of the species belonging to this genus. The Bros. de Alwis have figured the larva and pupa of a Ceylon species (*ante*, p. 186, fig. 48), the first of which is said to feed on *Aralisia*,\* and this seems to constitute the whole of the published information.

*Abisara* is distributed over a wide area; it is found in Tropical Africa and Madagascar, inhabits Continental India, Ceylon, the Andaman and Nicobar Islands, Burma, and the Malay Peninsula, being also represented generally throughout the Malayan Archipelago.

I have included under this genus, and in agreement with Mr. Butler, some species which by other authors have been placed in the genus *Taxila*, Doubl.†

A. *Posterior wings prominently angulated at apex of upper median nervule.*

1. **Abisara savitri.** (Tab. XVIII., fig. 5 ♀.)

*Abisara Savitri*, Felder, Wien. Ent. Mon. iv. p. 397, n. 12 (1860); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 1 (1877).

Female. Wings above pale ochreous-brown. Anterior wings with two pale transverse fasciæ crossing the apical half, and with two narrow submarginal pale linear fasciæ, each outwardly bordered with fuscous. Posterior wings with two broad pale fasciæ continuous to those of the anterior wings, the first somewhat curved and extending to abdominal margin, the second situate near outer margin and containing two large black spots with whitish surroundings separated by the discoidal nervule, a smaller spot situate between the subcostal nervules, and two small and subobsolete spots at anal angle; marginal linear fasciæ as on anterior wings, the outer margin long and linearly caudate at apex of upper median nervule, this prolongation being white. Wings beneath as above. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 44 to 46 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.): Ayer Panas (Godfery—coll. Dist.); Singapore (Brit. Mus.).

I am still without the male of this species, both sexes of which, judging from collections already passed through my hands, appear to be somewhat scarce or seldom captured.

2. **Abisara kausambi.** (Tab. XVIII., figs. 10 ♂, 11 ♀.)

*Abisara Kausambi*, Felder, Wien. Ent. Mon. iv. p. 397, n. 11 (1860); Moore, Proc. Zool. Soc. 1877, p. 587; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 545, n. 2 (1877).

Male. Wings above dark reddish-brown. Wings beneath somewhat paler; anterior wings crossed by two pale fasciæ on the apical half and with a submarginal pale linear fascia, outwardly bordered with

\* Moore's Lep. Ceyl. i. p. 69.

† Mr. Bates (Journ. Linn. Soc., Zool. vol. ix. p. 414) and Mr. Kirby (Cat. Diurn. Lep. p. 285) both take the contrary view. Mr. Scudder (Proc. Am. Ac. Art & Sci. vol. x. p. 276, 1875) gives the species *haquinus* (here included in the genus *Abisara*) as the type of *Taxila*, but this is not borne out by the original describers of the genus, who give that species as a varietal form only of *Taxila*.

dark castaneous and becoming obsolete at apex; posterior wings with two pale fasciæ as on anterior wings, but curved and wider apart, the outer fascia containing three apical black spots surrounded with whitish and separated by the subcostal nervules, and with two smaller spots near anal angle; a pale and darkly bordered submarginal fascia as on anterior wings, but which from apex of upper median nervule (where the outer margin is obtusely angulated) to anal angle is again outwardly bordered with paler coloration.

Female. Wings generally much paler in hue than in the male; anterior wings with a distinct subapical transverse subviolaceous or whitish fascia, and with the submarginal linear fascia distinct as beneath; posterior wings with the spots and fasciæ, both above and beneath, as on underside of male;\* the subapical pale fascia on anterior wings being broader beneath than above.

Exp. wings, ♂ 42 to 44 millim; ♀ 40 to 44 millim.

HAB.—Andaman Islands; Port Blair (Moore).†—Malay Peninsula; Province Wellesley (colls. Dist. and Saüer); Sungei Ujong (Durnford—coll. Dist.); Malacca (Biggs, coll. Dist.—Pinwill, Brit. Mus.); Singapore (Kerr—coll. Dist.)—Sumatra.—Java (Brit. Mus.)—Borneo; Sandakan (Pryer—coll. Dist.)—East Africa; Zambesi (coll. Hewits.); Nyassa (coll. Dist.).

The females of this species vary considerably in the size and distinctive character of the pale subapical fascia to the anterior wings. The most strongly marked or albinic specimens in my collection are from Province Wellesley, whilst the most melanic forms I possess are from Malacca and North Borneo. Consequently, were I to theorise from the specimens now before me, I should consider the species to increase in melanism in an easterly direction, a conclusion which actual facts would probably contradict. The specimens figured are from Province Wellesley.

The most interesting fact in connection with the geographical distribution of this species is its presence, unmodified and distinct, in Eastern Africa. The late Mr. Hewitson received it from the Zambesi, and subsequently it reached my hands contained in a small collection made in the neighbourhood of Lake Nyassa.

B. *Posterior wings not prominently angulated.*

### 3. *Abisara haquinus*. (Tab. XVIII., fig. 13 ♀.)

*Papilio Haquinus*, Fabricius, Ent. Syst. iii. 1, p. 55, n. 169 (1793).

*Emesis Drupadi*, Horsf. Cat. Lep. E.I.C. t. 2, f. 3, 3a (1828); Boisd. Sp. Gén. i. t. 7, f. 2 (1836).

*Abisara haquinus*, Butl. Cat. Fabr. Lep. p. 137, n. 2 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 546, n. 3 (1877).

*Taxila haquinus*, Kirby, Cat. Diurn. Lep. p. 286, n. 2 (1871).

Male. Wings above dark purplish-brown; anterior wings with a subapical pale and somewhat ochraceous fascia; apical portion of the nervules in both wings paler. Wings beneath much paler than above, the discal areas reddish; anterior wings with a curved pale fascia on upper portion of cell and immediately beneath the subcostal nervule, a subapical pale ochraceous fascia as above, and with the following bluish markings more or less spotted with black, viz.:—an oblique spot reaching apex of cell, two black spots beyond cell connected by a bluish lunule, above which are some small black spots divided by the subcostal nervules; these are outwardly followed by a straight series of about four spots (the lowest situate above the first median nervule), two on each side of the second median nervule, and one on inner side and at base of third median nervule; a submarginal series of linear pale continuous lunules becoming obsolete

\* By an accident, the figure of the female here given has been rendered inexact; thus the posterior wings above do not possess two contiguous discal fasciæ, but should be as correctly shown beneath. The submarginal spots should be as shown on the underside, save that the first black spot between the subcostal nervules has been there omitted.

† This habitat has not been certified by Wood-Mason and de Nicéville in their enumeration of Andaman Rhopalocera.

towards apex. Posterior wings with two short pale oblique fasciæ at base, a discal series of about eleven blue and black markings as on anterior wings, and a submarginal series of obscure dark conical spots, through which pass two series of pale, transverse linear spots, the inner series being distinctly lunulate. Body above concolorous with wings, beneath with legs greyish-brown.

Female. Above reddish, the dark spots beneath visible above; anterior wings with a prominent subapical white fascia. Wings beneath generally as in male, excepting the white subapical fascia.

Long. ♂ and ♀, 48 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (coll. Godfery).—Java (Horsfield—Brit. Mus.)—Borneo (coll. Dist.)

I have not figured the male, which is, however, easily recognised by its uniform dark colour above, with subapical ochraceous fascia to anterior wings, and beneath by its general resemblance to the female.

#### 4. *Abisara thuisto*.

*Taxila Thuisto*, Hewitson, Ex. Butt. ii. Tax. t. 1, f. 5, 6 (1861); Druce, Proc. Zool. Soc. 1873, p. 347, n. 1.

*Abisara Thuisto*, Butl. Ann. Nat. Hist. ser. 4, vol. v. p. 363 (1870).

Male. Wings above uniform and very dark indigo-blue or black. Wings beneath bright reddish-brown; anterior wings with the apex paler, an oblique bluish fascia crossing cell; a number of irregularly shaped blue and black discal spots arranged in three series, the outer most distinct consisting of six spots divided by the nervules, the upper three being very pale, and a submarginal series of linear blue spots margined with black situate between the nervules; the fringe black; posterior wings with a transverse bluish fascia crossing cell and extending to near costa, and with a number of irregularly shaped blue and black discal spots as on anterior wings, of which the outer are the most prominent, and which are placed between the nervules; submarginal linear spots as on anterior wings, and the fringe black. Body above concolorous with wings, beneath somewhat paler; legs ochraceous.

Female. The following is Hewitson's description of this sex, which I have not yet received from the Malay Peninsula:—

"Rufous, clouded at the base. Both wings crossed transversely beyond the middle by a band of oblong black spots, each spot marked with dull blue—those near the costal margin of anterior wing interrupted by five white spots. Both wings with a band of lunular black spots near the outer margin, each spot traversed by a line of blue or white. Anterior wing with a transverse band of black spots before the middle. Underside does not differ from the male, except that it is lighter."

Exp. wings, ♂ 35 millim.; ♀ "1½ in."

HAB.—Malay Peninsula: Sungei Ujong (Durnford—coll. Dist.); Singapore (Hewitson).—Sumatra (coll. Hewits.)—Borneo (coll. Godm. & Salv.)

A single male specimen received from Sungei Ujong (and subsequent to the completion of the coloured plate) constitutes the only representative of the species I possess from this region. This specimen is figured in the above woodcut (fig. 51), the female (fig. 52) being copied from Hewitson's 'Exotic Butterflies.'



FIG. 51.—*Abisara thuisto*, ♂.



FIG. 52.—*Abisara thuisto*, ♀.

5. *Abisara tanita*. (Tab. XVIII., fig. 14 ♀.)

*Tacila tanita*, Hewitson, Ex. Butt. ii. Tax. t. 1, text (1861); Druce, Proc. Zool. Soc. 1873, p. 347, n. 4; Kirby, Cat. Diurn. Lep. p. 286, n. 5 (1871).

*Tacila Orphna*, Doubl. Hew. (nec Boisd.), Gen. Diurn. Lep. t. 69, f. 6, 7 (1851).

*Abisara (Laxita) tanita*, Butl. Trans. Linn. Soc. ser. 2. Zool. vol. i. p. 546, n. 4 (1877).

Female. Above bright purplish-red; anterior wings with the margins, the base, and a broad basal streak between the lower median nervule and the submedian nervure pale fuscous; posterior wings with the margins (costal and abdominal margins broadly) and some broad streaks situate in cell and between the nervules pale fuscous. Wings beneath bright purplish-red; anterior wings with upper and apical blue streaks in cell, the last margined outwardly with black, and with some blue and black discal spots, of which the largest and most prominent are two beyond cell, and two divided by the second median nervule; two faint bluish submarginal linear fasciæ which become obsolete at apex, and the costal margin broadly fuscous near base; posterior wings with some transverse series of black and blue spots at base, some large elongate black submarginal spots with blue centres between the nervules, and blue and yellow submarginal linear fasciæ, between which the colour is fuscous; posterior margin fuscous. Body pale fuscous; legs pale obscure ochraceous.

Exp. wings, ♀ 38 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Brit. Mus.)—Borneo (Druce).

I have not received, nor have I been able to examine a male specimen of this species, which, as figured by Doubleday and Hewitson,\* has the wings above fuscous, with the apex and the outer margin of the anterior wings broadly, and the apical portion of the outer margin of the posterior wings narrowly pale reddish; the apex of the anterior wings being palest, and the margin of the posterior wings containing a fuscous line.

It is likely that the subgenus (*Laxita*) proposed by Mr. Butler for the reception of this species may subsequently be used in a generic sense, though its founder stated that he was "doubtful of its generic distinction." The relative positions of the bases of the first and second subcostal nervules of the anterior wings are somewhat aberrant.

6. *Abisara damajanti*.

*Abisara Damajanti*, Felder, Wien. Ent. Mon. iv. p. 397, n. 13 (1860).

*Tacila Damajanti*, Kirby, Cat. Diurn. Lep. p. 286, n. 6 (1871).

This species is only known to me by Felder's description, † and is evidently closely allied to *A. tanita*. The following is the original diagnosis:—

"Alis rubris, supra immaculatis, subtus maculis discalibus cyaneis (singula maculæ atræ imposita), posticis strigis quatuor submarginalibus, prima cyanea, secunda et quarta fuscis, tertia albida. ♂.

"Coll. Felder.—Species perpulehra *A. Orphnae*, Boisd., valde affinis, pagina antem inferiore alarum anticarum maculis cyaneis ornata sufficienter diversa."

\* Gen. Diurn. Lep. t. 69, f. 6 and 7.

† "In peninsula Malayica collecta."

## Genus STIBOGES.

*Stiboges*, Butler, Proc. Zool. Soc. 1876, p. 308.

The interesting species, on which this genus is founded, is only known to me by Mr. Butler's description and figure, both of which are here reproduced:—

“Allied to *Abisara*, aspect of *Nymphidium*.”\*

“Wings with rounded outer margin broad, costal nervure of primaries terminating abruptly at about the middle of the costa, opposite to the end of the discoidal cell; subcostal with five branches, the last two forking to apex; upper radial emitted from the inferior margin of the subcostal near its origin; lower radial nearly equally dividing the disco-cellulars, which are concave; second and third median branches emitted near together; precostal of secondaries short, oblique, directed backwards; costal nervure short, straight, oblique, terminating at basal third of costa; subcostal forking beyond the end of cell, the upper fork running close to the margin from the second third of costa; radial emitted close to the subcostal, reducing the upper disco-cellular to a point; lower disco-cellular long, oblique, nearly straight; second and third median branches emitted nearer together than the first and second; body slender; eyes prominent; antennæ slender, submoniliform; palpi very small. Type *Stiboges nymphidia*, n. sp.”

1. *Stiboges nymphidia*. (Tab. XXIV., fig. 11.)

*Stiboges nymphidia*, Butler, Proc. Zool. Soc. 1876, p. 309, n. 1, t. xxii. f. 1.

“Wings semitransparent, snow-white; primaries with broad costal and external dark-brown borders, sinuated internally; two irregular submarginal series of unequal white spots; secondaries with a broad outer border, undulated internally; a sinuated disco-submarginal lunulated pale brown line; a submarginal series of elongated white spots; body dark brown; wings below as above; legs, palpi, and venter white.”

Exp. wings, “1 inch 9 lines.”

HAB.—“Penang (Roberts).”

## Fam. LYCÆNIDÆ.

*Lycænida*, Stephens, Ill. Brit. Ent. Haust. i. p. 74 (1827); Westw. Introd. Mod. Class. Ins. ii. p. 358 (1840); Gen. Diurn. Lep. p. 468 (1852); Bates, Journ. Entomol. vol. i. p. 220 (1861); ib. vol. ii. p. 177 (1864); Trimen, Rhop. Afr. Austr. p. 217 (1866); Moore, Lep. Ceyl. i. p. 69 (1881); Marsh. & De Nic. Butt. Ind. Burm. and Ceyl. vol. i. p. 18 (1882).

*Polyommata*, Swains. Phil. Mag. ser. 2, vol. i. p. 187 (1827).

Front legs perfect in the female, in the male more or less imperfect, the tarsi often wanting one or both of the tarsal claws, but densely spined beneath.

Pupa secured by the tail and a girdle across the middle.



FIG. 53.—Anterior legs (showing tarsi) of *Lampides elpis*.

\* An extensive Neotropical genus focussed in Tropical America.



FIG. 54.—Larva and pupa of *Amblypodia narada*. (From Horsf. & Moore, Cat. Lep. Mus. E.I.C.)

The larvæ are onisciform, or shaped like woodlice,\* and their habits (as far as our present slight knowledge allows us to form an opinion) are most interesting. Thus one Indian species, *Deudorix* (*Virachola*) *isocrates*, Fabr., has been described by Prof. Westwood † as residing “within the pomegranate in the caterpillar state, several (seven or eight) being found in one fruit; in which, after consuming the interior, they assume the chrysalis state, each having first gnawed a hole through the rind of the fruit for the escape of the future butterfly, and carefully attached the footstalk to the branch by a coating of silk to prevent its falling.” The late Dr. Thwaites ‡ has given some interesting facts. He states:—“It is difficult to realize that the larvæ of some species of these lovely *Lycanidae*, such as *Amblypodia*, &c., are carnivorous or even cannibal in their habits, and do not hesitate to eat their own brethren of the same brood, when any of the latter are commencing their change into the inactive chrysalis state, with their consequent inability to protect themselves from their voracious kindred, who devour them with avidity. Nature, however, finds a protection for these said helpless individuals, in the instinct of a species of ant (*Formica smaragdina*, Fabr.), which, finding a substance most palatable to it, secreted naturally from a glandular defined spot upon the bodies of these helpless larvæ, takes possession of them as ‘cows,’ surrounding each separate one and the leaf on which it had been feeding with a few silken strands of its web, protecting them jealously, and attacking most fiercely any living thing intruding upon them.” §

In the perfect insect the subcostal nervules number only three or four, || and I have myself found these, both with regard to number and position, as excellent characters in the separation and identification of genera. ¶ Many more genera undoubtedly exist than have hitherto been used in the systematic classification of the *Lycanidae*, and this could only have been expected

\* The character on which Dr. Horsfield described the *Lycanidae* as belonging to his “vermiform stirps” or family (see his Descr. Cat. Lep. Ins. Mus. E.I.C. pp. 20, 58 and 64). These larvæ induced Mr. Swainson, inspired by the views of Macleay, to trace some fanciful analogies by their resemblance to sometimes “a little tortoise” or to “armadillos.” He considered their principal analogy, however, in the *Annulosa* to be found in the *Vermes*, and remarked, “Now the only difference between the general form of these tortoise-like caterpillars and that of the common earthworm is this—that in the former the body is excessively contracted, whereas in the latter it is necessarily lengthened: the pointed extremities of the head and of the tail, in both animals, is a common character, which, as we have already seen, belongs to no other type of larvæ of insects or of vertebrate animals; this at once accounts for the excessive length of body possessed by all the gnawing quadrupeds (*Glîres*, Linn.), and by all the birds in the order of waders (*Grallatores*).”—(Hist. & Nat. Arrang. Ins. p. 66).

† Trans. Ent. Soc. vol. ii. pp. 1—8 (1837), and Gen. Diurn. Lep. p. 468.

‡ It is to be earnestly hoped that the entomological observations of this good observing naturalist have been recorded and preserved, so that their future publication may give us a contribution to the *real* description of the Lepidoptera of Ceylon.

§ Moore's Lep. Ceyl. i. p. 70.—Mr. Geo. Dimmock ('Psyche,' vol. iii. p. 395) states that “the larvæ of certain species of *Lycæna* have been found to attract ants, on account of an opening upon the dorsum of the eleventh segment, which gives out a liquid apparently containing sugar. Upon the twelfth segment, and evidently connected in function with the opening above mentioned, are two protrusile organs covered with fine hairs. The fact of ants being attracted to these larvæ was first observed, so far as I can learn, by Esper.”

|| In this statement I am only in apparent disagreement with Messrs. Marshall and De Niceville, who (Butt. Ind., Burm. & Ceyl. vol. i. p. 18) describe the subcostal nervure as “emitting only two or three branches,” as those authors with other authorities prefer to consider as the termination of the subcostal nervure, what I describe—and not alone—as an additional nervule. I cannot, however, agree with my friend Mr. Moore in treating as a fourth or fifth subcostal nervule what seems clearly the upper discoidal nervule, a course of treatment already repudiated by Hewitson (Ills. Diurn. Lepid. p. 214 (1878), but still continued by Mr. Moore, in his ‘Lepidoptera of Ceylon,’ which necessitates my diagnosis of genera disagreeing with his own, though I refer to such in the synonymy.

¶ I have not found the difficulty related by Mr. Hewitson, *viz.* “The branches from the subcostal nervure, which are such an assistance in determining the position of genera with regard to each other in other families, here avail little, and differ in the sexes of the same species” (Introduction to Illustr. Diurn. Lepid.—Lycæn.).



when we remember the small size of the butterflies and their consequent somewhat neglected structural examination.\*

Of their habits there are many scattered notes recorded which still require the aid of the assiduous collector and responsible editor. The curious habit of rubbing the erect posterior wings together has been noticed by many observers, and notably by Mr. Wallace, who, in the Amazon Valley, describes the wings as having the "appearance of revolving discs," † and by Mr. Trimen, who, in South Africa, represents the action of the wings as "resembling that of the blades of a pair of scissors when repeatedly opened and shut." ‡ This curious habit has been explained by Mr. Swinton, who has paid much and painstaking attention to the subject, as due to the process of "stridulation." § Although these small and exquisite butterflies are so brilliantly coloured, they yet, when at rest and with the under surface of their wings alone exposed, approximate very closely to the plants on which they settle, as instanced by Mr. Uhler, who, when collecting in Eastern Colorado, noticed two species which settled on an abundant "delicately blue lupin," and which when at rest on these flowers "were very difficult to recognise." ||

Some species seem to have a definite time of day for their appearance, but the evidence is too voluminous for insertion here, but examples are afforded by the statement of Lieut. Gervase F. Mathew that in England *Lycena arion* "is a butterfly that does not fly much after mid-day," ¶ whilst in India, according to a recent writer, \*\* "when the afternoon is drawing on, then many a rich Hair-streak will appear, and, taking its station in the middle of some large leaf, will open its wings just a little, and give you a peep of the dazzling blue within." ††

We are also indebted to that excellent and trustworthy observer Mr. P. H. Gosse for some interesting details obtained in North America. Referring to "*Polyommatus pseudargiolus*," he writes:—"In appearance and manner it much resembles the delicate little Hair-streaks (*Thecla*) with which it associates. Like them it appears to be very pugnacious, attacking with Quixotic knight-errantry any intruder, no matter how much bigger than itself. It is particularly gamesome a few hours after sunrise; taking its stand on some prominent leaf of a bush, it rushes out upon every butterfly that passes by; then they perform such swift and tortuous evolutions that the eye is unable to follow them: this lasts only for a few seconds; for having pursued the traveller three or four yards, the *Polyommatus* returns to the very same leaf to watch as before. All this, however, I believe is done in a spirit of play, and not with any

\* Some good lepidopterists, however, have taken a very opposite and synthetic view on this question, as, for example, Mr. Herman Strecker, who is, or was, of opinion that there was no reason "why all the N. American and European species, except the few contained in *Eumacus*, Hübn., should not be embraced within one genus, even including the *Theclas*" (Lepid. Rhopal. & Heteroc. p. 81 (1874), and Mr. Kirby is also of opinion that "the number of distinctly-defined genera is small" (Europ. Butt. & Moths, p. 44).

† Trans. Ent. Soc. 1859, p. 263.

‡ Rhop. Afr. Austr. p. 218.

§ 'Insect Variety,' p. 118.

|| Bull. Unit. States Geol. & Geogr. Surv. iii. p. 355 (1877).

¶ 'Entomologist,' vol. x. p. 71.

\*\* Eha, 'The Tribes on my Frontier,' p. 108.

†† This limited and punctual appearance of many insects is an interesting and peculiar phase which has scarcely received the notice that might have been expected. Even on Penang Hill, I found it reported that various species of *Cicadidæ* had different and set times of day at which to exert their "musical" efforts. But this did not escape the attention of the great and eloquent Humboldt, who, when giving the account of his memorable journey, forcibly remarks:—"We have seen that the insects of the tropics everywhere follow a certain standard in the periods at which they alternately arrive and disappear. At fixed and invariable hours, in the same season, and the same latitude, the air is peopled with new inhabitants, and in a zone where the barometer becomes a clock, where everything proceeds with such admirable regularity, we might guess, blindfold, the hour of the day or night by the hum of the insects and by their stings" ('Personal Narrative' (Eng. transl.), vol. ii. p. 277).

warlike intent. This constancy of resort to one individual leaf or twig is very singular and unaccountable: sometimes on my approach to one so situated, it has been alarmed and flown to a considerable distance, but, taking a flight round, it returns to the place; and presently there is the little thing alighting on the leaf again. The playful pugnacity just noticed seems almost peculiar to the *Lycenidae*.\* It remains to be seen if these habits are restricted to the western species alone, or whether, as is probable, similar proceedings may not be observed among the Eastern Lycenids.

The family is universally distributed, and wherever butterflies exist it seems that *Lycenidae* are found. This particularly applies to the smaller species, which have even been brought from the Arctic Regions, collected in 81° 45' N.†

In arranging the genera of this family as found in the Malay Peninsula, I have found it convenient to separate them under the three following proposed Groups, which I think will prove useful, and which I trust—in our present superficial knowledge—are not altogether unnatural:—

Posterior wings without filamentous tail-like appendages † near the anal angle.	- -	CURETARIA.
,, with minute filamentous or prominent tail-like appendages near the anal angle.		
Posterior wings convex, about as broad as long.	- - - -	CASTALARIA.
,, more or less elongate, distinctly longer than broad.	- -	APHNARIA.

#### Group CURETARIA.

This proposed division contains some of the most interesting genera found in the whole of the family, having singular and strongly marked structural peculiarities. It is, however, in Tropical and Subtropical Africa that it reaches its maximum in genera, of large and brilliantly coloured species, § whilst in Tropical America it is represented by the genera *Eumæus* and *Trichonis*, and in Australia by the genus *Ogyris*. It is also extensively, but more modestly, represented throughout the whole remaining area of Lycenid distribution. It is in this division also that some of the most aberrant forms of the *Lycenidae* are found.

\* 'Letters from Alabama,' pp. 144-5. Elsewhere, in the same work (p. 37), the author describes the *Thecla* as often returning after a flight, "like the flycatchers among birds, to the same spot from whence they departed; a projecting twig, or the topmost leaf of a bush."

† M'Lachlan, Journ. Linn. Soc., Zool. vol. xiv. p. 111 (1878). As regards local peculiarities of distribution, Mr. S. Scudder, in comparing the "butterfly faunas of Eastern North America and of Europe," found that the "blues" were better represented in Europe by "(38 to 13)," whilst the "hair-streaks" were most abundant in America by "(20 to 10)."—('Psyche,' vol. ii. p. 112 (1878).)

‡ This may prove to be an uncertain and illusory divisional character, if, as Herman Strecker reports on the North American representatives, "In some species the spring brood is tailless, whilst the summer generation of the same insect is provided with those ornaments" (Lepid. Rhopal. & Heteroc. p. 81 (1874). In such a case, however, the markings of the wings beneath would be similar, and I have not found this to be the case with any of the species now enumerated. Many of the figures here given are deficient in these tail-like appendages owing to their exceedingly fragile nature and their liability to mutilation in the process of capture. Lieut. Gervase F. Mathew advises the collector to box all small butterflies alive, and writes, "Abroad, in the tropics, where I have taken and boxed numbers of small *Lycenidae*, I have almost invariably found their delicate caudal appendages as perfect as when first captured" ('Entomologist,' vol. x. p. 38).

§ Amongst these African genera may be enumerated *Mimacraa*, *Pentila*, *Liptena*, *Phytala*, *Epitola*, *Hewitsonia*, and *Deloneura*.

## SYNOPSIS OF GENERA.

1. Three subcostal nervules to anterior wings.
  - A. Anterior wings with the costal margin slightly concave about centre. - - - - - PORITIA.
2. Four subcostal nervules to anterior wings.
  - B. Anterior wings with the costal margin normal.
    - a. Inner and outer margins of anterior wings almost subequal in length.
      - b. Third subcostal nervule of anterior wings emitted a little before end of cell. - - - - - CURETIS.
      - bb. Third subcostal nervule of anterior wings emitted a little beyond end of cell. - - - - - LIPHYRA.
    - aa. Inner margin of anterior wings considerably, or at least distinctly, longer than outer margin.
      - c. First subcostal nervule of anterior wings not anastomosed with, nor impinging on, costal nervure.
        - d. Third subcostal nervule of anterior wings emitted beyond end of cell.
          - e. Basal joint of tarsi elongated, widened and compressed. - - - - - GERYDUS.
          - ee. Basal joint of tarsi normal.
            - f. Apices of tibiae globosely incrassated. - LOGANIA.
          - dd. Third subcostal nervule of anterior wings emitted at or near end of cell. - - - - - ALLOTINUS.
          - ddd. Third subcostal nervule of anterior wings emitted before end of cell.
            - g. First subcostal nervule of anterior wings emitted beyond middle of cell. CYANIRIS.
            - gg. First subcostal nervule of anterior wings emitted before middle of cell. NEOPITHECOPS.
        - ec. First subcostal nervule of anterior wings impinging on the costal nervure. - - - - - ZIZERA.



FIG. 55.—Anterior wing of *Poritia phraatica*, showing subcostal nervules.



FIG. 56.—Arrangement of subcostal nervules in anterior wing of *Cyaniris lambi*.



FIG. 57.—Arrangement of subcostal nervules in anterior wing of *Neopithecops horsfieldi*.



FIG. 58.—Arrangement of subcostal nervules in anterior wing of *Zizera lisizone*.

## Genus PORITIA.\*

*Poritia*, Moore, Proc. Zool. Soc. 1865, p. 775; Hewits. Ills. Diurn. Lep., Lyc. p. 213 (1878).

Wings short and broad. Anterior wings with the costal margin slightly concave about centre; outer margin oblique, nearly straight or slightly rounded; inner margin slightly concave at base and then sinuated to outer angle (prominently in the male and obscurely in the female); first subcostal nervule emitted at about one-third from end of cell, second near end of cell, third emitted a short distance from apex of second.† Posterior wings convex at base and suddenly oblique to apex; posterior margin rounded and convex. Eyes naked; palpi long, the apical joint slender and pointed at apex; legs stout, femora pilose beneath; antennæ gradually increasing in thickness from the base, and terminating in a somewhat long and moderately thickened club; thorax robust. Posterior wings in the male provided with a long tuft of hairs near the base of cell.

\* Mr. Scudder remarks (Proc. Am. Ac. Arts & Sci. vol. x. p. 256 (1875), "The name is, correctly speaking, preoccupied, through *Porites* (Lam. Pol. 1816)." The two names do not, however, appear sufficiently similar to warrant the inconvenience incidental to the substitution of a new generic name.

† Mr. Moore describes the subcostal nervules as four in number; Mr. Hewitson corrects Moore, and says there are but two; according to my view there are three.

I have only described such features of the neuration as seem to be peculiar and indicative of the genus, and throughout this family shall pursue a similar course of treatment.

The species of *Poritia* exhibit a brilliancy of colour and markings which forcibly remind a lepidopterist of the glories of the Neotropical *Erycinidae*, and in this respect the genus is, I think, well placed at the commencement of the Eastern *Lycenidae*. The genus was founded by Mr. Moore for the reception of a N.E. Indian species, but *Poritia* has since been shown, and principally by Mr. Hewitson, to have its head-quarters and to reach its maximum of species in the Indo-Malayan region. Some thirteen species are described, and of these no less than seven are found in this fauna. Many of these are only known by the descriptions and figures of the late Mr. Hewitson, and the typical specimens contained in his magnificent collection, and I have failed to procure examples myself. It is perhaps idle to speculate on the number of species of the genus which remain to be discovered in the Malay Peninsula, but they certainly cannot be inconsiderable, and will eventually reward the efforts of an industrious collector.

1. *Poritia sumatræ*. (Tab. XXII., figs. 2 ♂, 3 ♀.)

*Pseudodipsas Sumatra*, Felder, Reise, Nov. Lep. ii. p. 259, t. 36, f. 24—26 (1865).

*Poritia Sumatræ*, Hewits. Ills. Diurn. Lep., Lyc. p. 218, n. 12 (1878); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 546, n. 1 (1877).

Not having received this species, I have thought it best to copy Felder's diagnosis, with his figures (*supra*).

“♂. Alæ supra dilute virenti-cyanæ, in certo situ vivide vireutes, anticæ plus quam bitriente antico vittulaque anali fuscis, posticæ limbo costali margineque posteriore ante cilia fuscis.”

“Alæ subtus cano-brunneæ, figuris numerosis ochraceo-fulvis, fusco cinetis in fascias digestis serieque antimarginali macularum rhombicarum fundo dilutiorum, pupillis fulvis nigro atomatis.”

“♀. Alæ supra dilute violaceo-cyanæ, vittulis fulvo-fuscis apud venarum inferiorum extima, anticæ limbo costali et terminali fuscis, hoc fasciis duabus macularibus fundi coloris diviso (interiore multo brevior), litura discocellulari fulvo-lateritia nigro cineta, posticæ limbo antico pallide fusco, margine externo late fusco, lunulis strigaeque anteciliari fundi coloris diviso.”

“Alæ subtus ut in mare, sed maculis submarginalibus introrsum triangularibus.”

Exp. wings, ♂ 30 millim.; ♀ 34 millim.

*Var. ?* (Tab. XX., fig. 12 ♀.)

This figure represents the female specimen collected by Capt. Pinwill and contained in the British Museum,\* which has been identified by Mr. Butler as belonging to Felder's species. The differences, however, between that author's figure and the specimen thus identified are so considerable that it is probable that the female of another species has been confused with that of Felder.

HAB.—Malay Peninsula; Penang; Malacca (Pinwill—Brit. Mus.); Singapore (coll. Hewits.†)—Sumatra (Felder, and coll. Hewits.).

\* The figure was drawn by Mr. Wilson, and kindly approved by Mr. Butler.

† “Cat. Coll. Diurn. Lep. form. by the late W. C. Hewitson,” p. 166.

2. *Poritia phraatica*. (Tab. XXI., fig. 21 ♂; Tab. XXIV., fig. 8 ♀.)

*Poritia Phraatica*, Hewitson, Ills. Diurn. Lepid., Lyc. p. 214, n. 2, t. 88, f. 2 ♀ (1878).

*Poritia Pleurata* ♀, Hewits. Trans. Ent. Soc. 1874, p. 346.

Male. Allied to the corresponding sex of the preceding species, but larger and with the black area of the anterior wings smaller, its inner margin somewhat concavely occupying the end of the cell, after which it is more or less convexly continued to the lower median nervule, and is then marginally continued to angle, where there is a short black streak along the submedian nervure. Wings beneath with the markings closely resembling those of *P. sumatræ*, but much paler in hue.

Female. Wings above bright ochraceous. Anterior wings with the costal, outer and inner margins broadly dark brown. Posterior wings with the basal half (notched posteriorly), a broad fascia occupying the margin from apex to upper median nervule, and then deflected transversely across the wing to a little above anal angle, and three large conical marginal spots separated by the median nervules dark brown. Wings beneath as in male, but much paler.

Exp. wings, ♂ and ♀, 35 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Singapore (coll. Hewits.).

The female specimen here figured is paler on the posterior wings than depicted by Hewitson's figure, and is evidently a slight variety of the species. The male was unknown to Mr. Hewitson, and is here described for the first time.

*The following species are alone known to me by Hewitson's figures and descriptions, which are here reproduced.*

3. *Poritia pleurata*. (Tab. XXII., fig. 6 ♂; 5 ♀.)

*Poritia Pleurata*, Hewitson, Trans. Ent. Soc. 1874, p. 346; Ills. Diurn. Lep., Lyc. p. 215, t. lxxxviii. f. 3, 4 ♂, 5 ♀ (1878).

“Upper side. *Male*.—Brilliant blue. Anterior wing with the costal margin and apical half, which is marked by two blue spots, dark brown. Posterior wing with the costal margin broadly brown; the outer margin black, spotted with white.”

“Under side white, crossed everywhere by rufous bands and spots, and marked near the outer margin by a series of singularly-formed spots. Anterior wing with a black spot at the anal angle. Posterior wing with three black spots, the spot nearest the anal angle crowned with orange.”

“*Female*.—Cerulean-blue, clouded at the base. Anterior wing with the apical half dark brown, crossed by five pale blue spots. Posterior wing with the costal and outer margins dark brown, the outer margin marked by two black spots crowned with blue.”

Exp. wings, “♂ 1½, ♀ 1⅞ inch.”

HAB.—Malay Peninsula; Singapore (Wallace & Buxton, coll. Hewits.).

Mr. Hewitson's description of the posterior wing of the female is, to say the least, but sketchy. In the absence of a specimen it is, however, safer to simply reproduce both the original figure and description.

4. *Poritia phalena*. (Tab. XXII., fig. 8 ♂.)

*Poritia Phalena*, Hewitson, Trans. Ent. Soc. 1874, p. 344; Ills. Diurn. Lep., Lye. p. 216, n. 8, t. 89, figs. 14 & 15 ♂ (1878).

“Upperside. *Male*.—Black. Both wings marked by bands and spots of green. Anterior wing with a longitudinal narrow band from the base to the middle, a bifid spot on the inner margin, a trifold spot near the costal margin, and a submarginal series of six spots. Posterior wing with a band near the inner margin, two submarginal spots, and three spots on the outer margin; one of them, which is at the anal angle, large and marked by a black spot.”

“Underside rufous-brown. Anterior wing crossed at the middle by a band of white, and beyond it by a series of five grey spots. Posterior wing white, with the base and apex rufous-brown, several small brown spots near the middle, followed by three larger spots of the same colour; four large marginal spots, their centre borders black.”

Exp. wings,  $1\frac{5}{8}$  inch.”

HAB.—Malay Peninsula; Singapore (Wallace—coll. Hewits.).

5. *Poritia pheretia*. (Tab. XXII., figs. 9 ♂, 10 ♀.)

*Poritia Pheretia*, Hewitson, Trans. Ent. Soc. 1874, p. 346; Ills. Diurn. Lep., Lye. p. 217, n. 9, t. 89, figs. 17 & 18 ♂ 16 ♀ (1878).

“Upperside. *Male*.—Anterior wing black, with a band from the base to the middle, a band on the inner margin, and a transverse band of four spots beyond the middle, all green-blue. Posterior wing green-blue, with the costal margin and a spot below the middle dark brown.”

“Underside rufous, pale. Anterior wing crossed at the middle by a band of white. Posterior wing irrorated with white at the middle and crossed by a band of brown spots; three large spots on the outer margin; the two largest at the anal angle, white bordered with black, the middle spot marked with black, the outer spot black.”

“*Female* rufous-brown. Posterior wing with the outer half nearly lilac-white: underside like the male, except that the anterior wing is crossed by a second band of white.”

Exp. wings, “ $1\frac{1}{15}$  inch.”

HAB.—Malay Peninsula; Singapore (Wallace—coll. Hewits.).

6. *Poritia pediada*. (Tab. XXII., fig. 16 ♀.)

*Poritia Pediada*, Hewitson, Ent. Mo. Mag. vol. xiii. p. 223 (1877); Ills. Diurn. Lep., Lye. p. 218, n. 11, t. 89, figs. 21 & 22 ♀ (1878).

“Upperside. *Female*.—Dark brown, slightly tinted with dull blue; outer margin of posterior wing dentate near the middle, traversed from the dentation to the anal angle by a pale blue line.”

“Underside red-brown. Both wings crossed transversely by two bands of lilac-white, one near the middle, the other submarginal. Posterior wing with a short band of the same colour between the others, and a submarginal line of white.”

Exp. wings, “ $1\frac{3}{10}$  inch.”

HAB.—Malay Peninsula; Singapore (Buxton—coll. Hewits.).

7. *Poritia potina*. (Tab. XXII., fig. 7 ♀.)

*Poritia potina*, Hewitson, Trans. Ent. Soc. 1874, p. 347; Ills. Diurn. Lep. Lyc. p. 215, n. 4, t. 88, figs. 6 & 7 ♀ (1878).

“Upperside. *Female*.—Rufous-orange. Anterior wing with the apex, the outer and inner margins, and a linear spot at the end of the cell dark brown. Posterior wing angular a little below the apex, clouded with rufous-brown, and marked by three large brown spots near the outer margin.”

“Underside rufous, tinted with lilac. Both wings with a linear spot at the end of the cell; both crossed before the middle by a rufous-brown band (broken into spots on the posterior wing), and beyond the middle by two bands (near together) of the same colour.”

Exp. wings, “ $1\frac{4}{10}$  inch.”

HAB.—Malay Peninsula; Singapore (Wallace—coll. Hewits.).

## Genus CURETIS.

*Curetis*, Hübner, Verz. bek. Schmett. p. 102 (1816); Moore, Lep. Ceyl. i. p. 73 (1881).

*Phædra*, Horsf. Cat. Lep. E.I.C. p. 123 (1829).

*Anops*, Boisd. Spec. Gén. i. t. 23, f. 1 (1836); Westw. Gen. Diurn. Lep. p. 473 (1852).

Anterior wings subtriangular; costal margin strongly arched at base, and then almost obliquely straight to apex, which is either subacute or prominently and falcately acute; outer margin concavely sinuate where the apex is produced; inner margin concavely sinuate in the male, obscurely so in the female; first subcostal nervule emitted at about one-third before end of cell, second at one-fourth before end of cell, third and fourth bifurcating about midway between end of cell and apex of wing. Posterior wings rounded, the anal angle more acute in the male than in the female; subcostal nervules bifurcating near end of cell. Eyes hairy; palpi porrect, clothed with fine adpressed scales; apical joint slender, longer in the female than in the male; antennæ short, gradually thickened into a long apical club; legs short, thick and densely clothed with scales; anterior tarsus of the male consisting of a single joint, with an obtuse apical claw and with some fine spines beneath; anterior tarsus of the female five-jointed, with two small apical claws.

The geographical range of *Curetis* includes Continental India, Ceylon, the Andaman and Nicobar Islands, Burma, the Malay Peninsula, and probably the whole length and breadth of the Malayan Archipelago.

This genus exhibits features of structural variability which await the explanation of the local biological observer. In structure, the apical angles of the anterior, and the anal angles of the posterior wings are either acutely produced or obtusely subacute. There are also three forms of sexual dissimilarity; firstly, in which the female has the pale markings whitish, as in *C. asopus*; secondly, in which the female pale markings are of an ochraceous character, as in *C. felderi*, both of these forms having the male entirely dissimilar; and thirdly, in which the male approaches the peculiar markings of the female, as in *C. sperthis*.

1. *Curetis malayica*. (Tab. XXII., fig. 28 ♂.)

*Anops Malayica*, Felder, Reise Nov. Lep. ii. p. 221, t. 28, f. 18 (1865); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 546, no. 1 (1877).

Not having received this species myself from the Malay Peninsula, I have followed my previous course of giving a copy of both Felder's diagnosis and figure.

"♂. Alæ supra cupreo-rutilæ, anticæ limbo costali, apud venulam transversam dentem subtilem emittente, nigro-fusco, triangulum sat latum apicalem intus excisum et hoc in triangulum analem nigro-fuscum, in marginem internum obscuriorem se perdentem transeunte, posticæ vittula juxta truncum subcostalem, atomaria margineque externo, postice latiore et atomario nigro-fuscis, dimidio apicali costæ fusco, regione anali obscuriore."

"Alæ subtus subargenteo-albæ, nigro punctulatæ, striga externa undulata interrupte fracta ex atomis nigris, altera submarginali obsoleta, punctis nigris intramarginalibus, anticæ maculis tribus minutis nigris subcostalibus."

Exp. wings,\* 45 millim.

HAB.—Burma (coll. Dist.)—Malay Peninsula; Malacca (Com. de Castelnau—coll. Felder; Pinwill—Brit. Mus).

The female of this species has probably the ground colour white, instead of red, as obtains in the female sex of *C. bulis* and *C. æsopus*.

2. *Curetis æsopus*. (Tab. XXIV., fig. 12 ♂.)

*Papilio Æsopus*, Fabricius, Sp. Ins. p. 125, n. 565 (1781); Mant. Ins. p. 79, n. 719 (1787); Ent. Syst. iii. p. 307, n. 164 (1793).

*Anops Æsopus*, Butl. Catl. Fabr. Lepid. p. 160, n. 1 (1869).

Male. Wings above closely resembling those of *C. malayica*, but the anterior wings having the black area more reduced, and not widened at outer angle nor extending along inner margin. Wings beneath pearly-white; anterior wings with a pale bluish oblique lunulated fascia, outwardly and narrowly margined with blackish, commencing at upper discoidal nervule, and a marginal series of small black spots preceded by an obscure pale bluish lunulated fascia; posterior wings with a short oblique pale bluish fascia commencing on costal nervure a little before apex; some short and similar indistinct fasciæ on disk and a marginal series of black spots preceded by a pale bluish lunulated fascia as on anterior wings. Body above fuscous; beneath with the sternum and legs greyish white, the femora and tibiæ more or less annulated with brownish; abdomen pale brownish; palpi greyish white, with their apices black.

Female. This is the sex of the typical specimen† contained in the Banksian Collection in the British Museum, and is thus described:—

"Alis integerrimis supra fuscis, macula alba; subtus albis immaculatis; habitat in India orientali."

Exp. wings, 40 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.).

Although I have not received the female from the Malay Peninsula, I have carefully compared the male specimen here figured with the female type of the Fabrician species, and

\* Felder's figure.—In all my given measurements the expanse is calculated from tip to tip of wing. Mr. Butler (Cist. Ent. vol. iii. p. 68) has recently argued that "fairly" it should be "from tip of wing to centre of thorax, doubled."

† I refer only to the type, and not to the Mouhncin specimens enumerated as belonging to the species by Mr. Butler (Cat. Fabr. Lepid. p. 160, n. 1 (1869)).



have no doubt as to their identity. It is quite (specifically or racially) distinct from *C. thetys*, Dru., and not synonymic with that species, as stated by Mr. Kirby\* and by Mr. Moore.†

### 3. *Curetis felderi*, † *n. sp.* (Tab. XXIV., fig. 3 ♂; Tab. XXII., fig. 26 ♀.)

Male. Wings less angular than in the preceding species, the apex of the anterior wing and the anal angle of the posterior wing more rounded and less produced. Colour above as in preceding species; anterior wings with the black area smaller, the apical portion more regularly concave interiorly, and narrower at outer angle; posterior wings with the outer black margin narrower. Wings beneath pearly white; markings as in preceding species, but the fasciæ darker and more continuous, the apex of the anterior wings also broadly infuscated.

Female. Wings above pale orange-yellow; anterior wings with the costal margin, the apex, outer margin, and outer half of inner margin broadly dark brown; posterior wings wholly dark brown, with the exception of a large discal orange-yellow patch extending from base of upper median nervule to apex of wing. Wings beneath as in the male, but with the fasciæ darker, broader, and more regularly curved and continuous. Body above dark brown; sternum and legs greyish white, tibiæ and tarsi annulated with brown; palpi greyish white, their apices dark brown.

Exp. wings, ♂ and ♀, 40 to 45 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Sungei Ujong (Godfery and Durnford); Singapore (Kerr).

This species is allied to *C. insularis*, Horsf. (with the type of which in the Horsfield collection I have carefully compared it§), but by the under surface, in particular, it is rendered very distinct.

### 4. *Curetis sperthis*. (Tab. XXII., fig. 27 ♀.)

*Anops sperthis*, Felder, Reise Nov. Lep. ii. p. 222 (1865); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 546, n. 2 (1877).

Female. Wings above dark chocolate-brown; a large discal streak on anterior wings, occupying nearly all the lower half of cell, and deflected and covering more than half of the median nervules, and a discal patch on posterior wings, which is much waved and sinuated and extends from near apex to upper median nervule, orange-yellow. Wings beneath pearly grey, with a small fuscous streak near end of cells of both wings, a waved fuscous linear fascia crossing both wings a little beyond middle, followed by a wider and more obscure fascia and a submarginal series of dark fuscous linear spots. Body both above and beneath more or less concolorous with wings. Palpi pearly grey, with their upper surface and apex fuscous. Legs pearly grey, more or less annulated with fuscous.

Male. A specimen of this sex in the British Museum resembles the female, but has the pale discal markings on the upper surface of the wings more reddish in hue, and the discal patch on the posterior wings larger in size.

Exp. wings, 41 millim.

HAB.—Malay Peninsula: Sungei Ujong (Durnford—coll. Dist.); Malacca (Castelnau—coll. Feld.; Pinwill—Brit. Mus.).

\* Syn. Cat. Diurn. Lepid. p. 418, n. 1.

† Lepid. Ceylon, vol. i. p. 74.

‡ Named after C. and R. Felder, whose memoir, "Lepidoptera nova in Pænisula Malayica Collecta" (Wien. Ent. Mon. iv. 1860) may be considered as the first real contribution to a knowledge of this Rhopalocerous fauna.

§ This important collection of Dr. Horsfield, containing so many types, is no longer kept in its separate condition at the British Museum, but is now incorporated with the general collection—a matter of some regret—until an account is published under what genera the species are placed, and which species are smk as synonyms of others.

I have only received a single female specimen of this apparently somewhat rare species. It is peculiar by the similarity of the sexes, the usual female characters of colour and markings being, in this species, also transferred to the other sex.

### Genus LIPHYRA.

*Liphyra*, Westwood, Proc. Ent. Soc. 1864, p. 31.

*Sterosis*, Feld. Reise Nov. Lep. ii. p. 219 (1865).

Body very short and robust; eyes large; palpi minute; antennæ gradually thickened from centre to apex.

Anterior wings subtriangular, the costal margin oblique and slightly arched, the outer margin convex, inner margin sinuated and coarsely hirsute; costal nervure extending to about centre of costal margin; first subcostal nervule emitted a little beyond centre of cell; second emitted at about half the distance from apex of cell as its base is from that of the first nervule; third and fourth bifurcating at about one-third the distance between end of cell and apex of wing; base of the upper discoidal nervule united with the subcostal nervule a little beyond end of cell; disco-cellular nervules robust, slightly concave. Posterior wings somewhat elongately ovate; the posterior margin rounded and convex; costal nervure extending to about apex of wing; first subcostal nervule emitted at about one-third before end of cell; cell very broad; second and third median nervules with their bases twice as wide apart as the distance separating the bases of the first and second. Legs robust.

This unique genus is known only by one species,\* which is probably the largest and most robust butterfly found in the whole of the *Lycenide*. Its geographical area can at present be only estimated by that of its sole representative.

#### 1. *Liphyra brassolis*.† (Tab. XXII., fig. 18 ♀.)

*Liphyra brassolis*, Westwood, Proc. Ent. Soc. 1864, p. 31; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 546, n. 1 (1877).

*Sterosis robusta*, Feld. Reise Nov. Lep. ii. p. 219, n. 237, t. 27, f. 10, 11 (1865).

Female. Wings above reddish ochraceous. Anterior wings with a large spot occupying apical two-thirds of cell and extending beyond it; two large spots beneath apex of cell divided by the middle median nervule, the apex and outer margin broadly and the inner margin narrowly for half its length fuscous or black; extreme outer margin castaneous. Posterior wings with five discal spots, one inside and two just beyond cell, and two divided by the middle median nervule, and the posterior margin broadly and inwardly sinuate, fuscous or black; extreme outer margin castaneous; abdominal margin somewhat darker. Wings beneath paler; anterior wings with the discal black spots present, but the apex and outer margin only mottled with brownish; posterior wings with the posterior two-thirds and the costal margin mottled with brownish, the black discal spots obsolete. Body and legs more or less concolorous with wings; eyes black; antennæ brownish.

Male. With the black markings on the upper surface of the wings larger and more distinct, on the anterior wings occupying the whole of the inner margin.

Exp. wings, ♂ and ♀, 68 millim.

\* Mr. Hewitson described two West African species as also belonging to this genus, but I quite agree with Mr. Kirby, and cannot believe that they "are correctly referred" in the generic sense (Ills. Diurn. Lep., Lyc. Suppl. pp. 34-5).

† This species has considerable superficial resemblance to those of the Tropical American genus *Brassolis*, from which it presumably owes its name.

HAB.—Continental India; Darjeeling (coll. Hewits.). Malay Peninsula; Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.). Borneo; Sarawak (coll. Hewits.). Gilolo;\* Dodinga (Lorquin—Felder).

This is always a somewhat scarce species. I have only received one (a female) specimen, and for this I am indebted to the entomological exertions of the Rev. L. C. Biggs. Capt. Pinwill also found it at Malacca, but it has not been received from those other parts of the Malay Peninsula in which considerable collections have been made.

### Genus GERYDUS.

*Gerydus*, Boisduval, Sp. Gén. i. t. 23, f. 2 (1836).

*Symetha*, Horsf. Cat. Lep. E.I.C. p. 59, t. 2, f. 2 (1828).

*Miletus* (nec Hübner), Westw. (part), Gen. Diurn. Lep. p. 502 (1852).

Anterior wings elongate and ovate, costal margin arched and convex, apex subacute, outer margin obliquely convex, inner margin nearly straight, very slightly concave; subcostal nervure with four nervules; first emitted about one-fourth before end of cell, second near end of cell, third a little beyond cell, and fourth minute, starting from third a little before apex. Posterior wings elongate and ovate, costal margin nearly straight, posterior margin convexly rounded, distinctly angulated in the female. Eyes naked, palpi very long, terminal joint long and slender; legs scaly and compressed, the first joint of the tarsi remarkably elongated, widened and compressed; antennæ slender, terminating in a slightly formed club.



FIG. 59.—Posterior leg of *Gerydus symethus*.

This is a truly remarkable genus, the enlarged and widened basal joint of the tarsi being a phenomenal character in Rhopalocera. The focus of the distribution of *Gerydus* appears to be in the true Malayan region.

It has been erroneously stated that one species inhabits ants' nests, but no real facts can be adduced in support of the assertion. †

#### 1. *Gerydus symethus*. (Tab. XX., fig. 2 ♂, and Tab. XXII., fig. 14 ♀.)

*Papilio Symethus*, Cramer, Pap. Ex. ii. t. 149, B, C. (1779); Stoll, Suppl. Cram. t. 37, f. 3, 3 C (1790).

*Polyommatus Symethus*, Godt. Enc. Méth. ix. p. 675, n. 180 (1823).

*Symetha Pandu*, Horsf. Cat. Lep. E.I.C. t. 2, f. 2, 2<sup>a</sup> (1828).

*Gerydus Symethus*, Boisd. Sp. Gén. i. t. 23, f. 2 (1836); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 546, n. 3 (1877).

*Miletus Symethus*, Kirby, Syn. Cat. Diurn. Lep. p. 336, n. 2 (1871); Snell. Tijd. Ent. xix. p. 152, n. 37 (1876).

\* Felder (Reise Nov. Lep. ii. p. 219) gives the habitat as "Halmahera." According to Crawford (Dict. Ind. Islds., &c., pp. 147 & 10) this name can be either spelt "Halmahera" or "Almahera," and is the equivalent of Gilolo.

† In 'Cassell's Natural History' (vol. vi. p. 44) it is stated that *Gerydus* (*Miletus*) *symethus* is "said to inhabit ants' nests." On asking my friend the author, Mr. W. F. Kirby, for the original authority of this statement he referred me to an article in the 'Entomologist's Weekly Intelligencer' (No. 142, p. 89), written by Mr. Stainton, where it is stated on the authority of Dr. Herrich-Schäffer, that the butterfly "took up its residence permanently within the nests of ants," and that "the accounts he had received of its habits led irresistibly to the conclusion that this singular butterfly never disported itself on the wing, but wandered listlessly in the labyrinths of the ants' nests." Mr. Stainton has obligingly informed me that "the information was no doubt acquired in conversation with Herrich-Schäffer." It only remains to say that the information given by that excellent entomologist must have become erroneously transposed, either—as is most probable—really referring to the larva of the butterfly, or—as is equally possible—to some other insect, perhaps a moth. For the butterfly is common in the Malay Peninsula, and I have received it from so many different collectors, sent home with other Rhopalocera captured on the wing, that had it been found only in ants' nests I must have received information of so uncommon an occurrence.

Male. Anterior wings above greyish-white, the base and basal half of costal area bluish-grey; about the apical half of wing black with its inner margin oblique and profoundly sinuate, and the apical third of inner margin of the same colour. Posterior wings bluish-grey, the costal area blackish, a pale discal streak extending through and beyond cell, and the fringe pale greyish. Wings beneath pale brownish. Anterior wings with an oblique central whitish fascia, before and beyond which the colour is dark bluish-grey, and with the following spots and fasciæ margined with grey:—two spots in cell, a disco-cellular elongate spot at apex of cell, a spot between the first and second subcostal nervules and another between the second and third, a waved fascia extending from fourth subcostal nervule to about upper median nervule, and a submarginal row of small dark spots placed between the nervules. Posterior wings with the following spots and fasciæ:—three beneath costal nervure, three crossing cell (the third at apex), two beneath cell (the second bifid), beyond these a waved transverse fascia crossing wing, and a waved submarginal dark line. Body and legs more or less concolorous with wings.

Female. Resembling the male, but with the posterior wings more elongated and angulated; the white area of the anterior wings much larger,\* and the white discal streak on the posterior wings also larger and more distinct.

Exp. wings, ♂ and ♀, 34 to 42 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.; Biggs—coll. Gosse and Dist.)—Java (coll. Horsf.); Batavia (Snellen).

Although the male specimens collected in Malacca, and now before me, show no variation, such uniformity in the species does not ensue when a larger series from the whole area of its distribution is examined. As I have noticed in the British Museum and other private collections, the variability is in the extent and distinctness of the white area to the anterior wings.

It is of this species that the erroneous statement as to its habitation in ants' nests has been ascribed (*antea*, p. 205).

## 2. *Gerydus biggsii*, † n. sp. (Tab. XXII., fig. 12 ♀.)

Female. Anterior wings brown, almost crossed near centre by an oblique white fascia, beyond which the brown colour is much darker and almost black. Posterior wings uniform brown, with the fringe paler. Wings beneath pale brownish; anterior wings with the white fascia as above; both wings with spots and fasciæ margined with grey, arranged similarly to those of *G. symethus*.

Male. Resembling the female, but with the white fascia to the anterior wings a little narrower, and the posterior wings more convex and less outwardly angulated.

Exp. wings, 30 millim.

HAB.—Malay Peninsula; Malacca (Biggs—coll. Dist.).

I have now received three specimens of this well-marked species, all collected at different times by Mr. Biggs at Malacca. I neither met with it myself in Province Wellesley, nor have I seen it in any of the many collections examined from other parts of the Peninsula.

\* In an allied Amboinese species, *G. boisduvalii*, Butl., the distinctive colouring of the sexes is reversed, the male having the largest white area to the anterior wings.

† I have named this species after its discoverer, the Rev. L. C. Biggs, now Chaplain at Malacca, who has devoted much of his leisure to the collection and study of the Rhopalocera of his district.

## Genus PARAGERYDUS, gen. nov.

Closely allied to *Gerydus*, but differing by having the first joint of the tarsi greatly elongated, but not widened and compressed as in *Gerydus*; the female also differs from the male in having the outer margin of the posterior wings dentately sinuate.

I failed to place this genus in the Synopsis (p. 197), believing, previous to close examination, that the following species really belonged to *Gerydus*, as hitherto classified. Its position is readily defined as allied to *Gerydus* and *Logania* by having the third subcostal nervule of the anterior wings emitted beyond the end of cell, and it differs from the first by the non-compressed and non-dilated tarsi, and from the second by the non-globosely incrassated tibial apices.



FIG. 60.—Posterior leg of *Paragerydus horsfieldi*.

1. *Paragerydus horsfieldi*. (Tab. XX., fig. 7 ♀.)

*Miletus Horsfieldi*, Moore (Horsf. & Moore), Cat. Lep. Mus. E.I.C. i. p. 19, n. 3, t. 1 a, f. 2 (1857); Druce, Proc. Zool. Soc. 1873, p. 347, n. 1.

*Gerydus Horsfieldi*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 546, n. 1 (1877).

Male. Wings above dark brownish; anterior wings with a pale ochraceous streak beyond cell, extending along the upper median nervule for about half its length. Wings beneath greyish, thickly mottled with irregularly shaped and sized brown markings; fringe pale brownish. Body and legs more or less concolorous with wings.

Female. Resembling the male, but with the anterior wings proportionally shorter and their outer margin convex; the outer margin of the posterior wings dentately sinuate, and the pale streak on the upper surface of the anterior wings almost obsolete.

Exp. wings, ♂ and ♀, 31 to 40 millim.

HAB.—Malay Peninsula; Penang (Brit. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.)—Java (coll. Horsf.)—Borneo (Lowe—coll. Godm. and Salv.).

Two specimens received from Singapore, and both males, are smaller than the female here figured, which itself does not equal in size some large male specimens captured at Sungei Ujong. It is therefore very evident that size is a very variable element in the form of this species.

2. *Paragerydus nivalis*. (Tab. XXII., fig. 11 ♀.)

*Miletus nivalis*, Druce, Proc. Zool. Soc. 1873, p. 348, n. 4.

*Gerydus nivalis*? Butl. Trans. Linn. Soc. ser. 2, Zool. vol. 1, p. 546, n. 2 (1877).

My only knowledge of this species is derived from the Bornean type described by Mr. Druce, and a Malaccan specimen in the British Museum, from which the figure is taken. The following is the original description:—

“Male. Upperside dark brown. Underside white, speckled with pale brown. Anterior wing with six black spots close to the outer margin; posterior wing with five.”\*

Exp. wings, “1 inch.”

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.)—Borneo (Lowe—coll. Godm. & Salv.).

\* These spots would be more correctly described as marginal, and are scarcely reducible to the numbers given.

## Genus LOGANIA, \* gen. nov.



FIG. 61.—Posterior leg of *Logania malayica*.

Anterior wings irregularly subtriangular; costal margin convex, the apex acutely produced, outer margin deeply and concavely sinuate, inner margin nearly straight; costal nervure extending to near middle of costal margin, first subcostal nervule emitted a little beyond middle of cell, second midway between base of first and apex of cell, third and fourth bifurcating at about two-thirds the distance from end of cell and apex of wing; bases of the first and second median nervules one-third nearer together than the bases of the second and third. Posterior wings elongate, the costal margin nearly straight, the posterior margin deeply sinuate, first subcostal nervule emitted a little before the end of cell; palpi very long, hirsute, the apical joint slender, but clothed with adpressed hairs (*antennæ mutilated*); legs with the apices of the tibiæ more or less globosely incrassated, the femora with a few slender spines.

This peculiar genus, which possesses superficially a Heterocerous appearance, is probably found throughout the Malay Peninsula. I have received but one species; but a second, from Tenasserim, belonging to the Calcutta Museum, has been shown me by Mr. F. Moore. Of the species here described female specimens have alone reached my hands.

1. *Logania malayica*, n. sp. (Tab. XXII., fig. 21 ♀.)

Female. Wings above white; anterior wings with the costal margin narrowly fuscous and the apical area narrowing to outer angle of the same colour; posterior wings with the outer margin very narrowly fuscous. Wings beneath white, thickly and irregularly mottled with brown. Body and legs brownish.

Exp. wings, ♀, 23 to 25 millim.

HAB.—Malay Peninsula; Sungei Ujong (Godfery and Durnford—coll. Dist.).

## Genus ALLOTINUS.

*Allotinus*, Felder, Reise Nov. Lep. ii. p. 285 (1865).

“Antennæ sensim incrassatæ, paullo longiores, quam in Mileto.”

“Palpi articulo tertio aciculari sat longo, præsertim in feminis.”

“Alæ anticæ vena subcostali triramosa,† ramo tertio sat longe pone cellulam emisso vena discoidali superiore e cellulæ clausa nata, venula discocellulari suprema distincta.”

“Pedes sat longi, gracillimi, aciculares, tibiis posticis femora subæquantibus.”

Felder's original diagnosis of his genus is here given, as I have neither the Singapore species which he includes in it, nor have I both sexes of any other species of the genus, which is readily separable from the preceding genera by the position of the third subcostal nervule of the anterior wings.

One species has been described from Singapore, and others from Java, Celebes, and the Philippine Islands, but doubtless many more remain to be discovered and the true geographical range of the genus cannot at present be rigidly defined, though its head-quarters appear to be in the Indo-Malayan region.

\* I have dedicated this genus to my friend and colleague, David Logan, the inspirer and sustainer of this work.

† In *A. subviolaccus*, Feld. (the only species I possess), there are four subcostal nervules, as in *Gerydus*, but differing in having the third nervule emitted at end of cell.

1. *Allotinus unicolor*.

*Allotinus unicolor*, Felder, Reise Nov. Lep. ii. p. 286, n. 369 (1875).

“♂. Alæ supra rufescenti-fuscæ, anticæ marginem versus obscuriores, posticæ ciliis sordide albidis, margine ante ea obscuriore.

“Alæ subtus glaucescenti-albæ, ciliis fusco-albis, apud venarum exitus obsolete nigro-fusco maculatis, omnes, anticæ limbo interno solum excepto, fusciscenti subtiliter variegatæ, serie submarginali margini parallela macularum parvularum fusciscentium, anticarum maculis quinque costalibus arrosis, macula minuta et litura transversa in cellula, fasciola discocellulari fasciaque exteriori, maculis sex inequalibus formata, posticarum maculis quatuor minutis basalibus, maculis binis cellularibus, fasciola discocellulari arrosa, maculis duabus subcostalibus subbasalibus, duabus subcostalibus grossioribus in medio (superiore magis extrorsum jacta), aliis sex posterioribus in serie margini parallela (duabus intermediis elongatis, reliquis paribus, decrescentibus) septinaque parva interna cano-brunneis.”

“Abdomen cano-fuscum, ventre albido.”

HAB.—Malay Peninsula; Singapore (Wallace—coll. Feld.).

Felder does not give the exact dimensions of this species, but refers it in general terms to the size of two other members of the genus. From this we may infer that it is somewhat of the size of *Gerydus symethus*.

## Genus NEOPITHECOPS, gen. nov.

*Pithecopis*, Moore (nec Horsfield), Lep. Ceyl. i. p. 72 (1881).

Wings broad. Anterior wings with the costal margin arched and convex, outer margin convex, inner margin slightly sinuate. Costal nervure not extending to centre of costal margin; first, second, and third subcostal nervules emitted at about equal distance from each other before end of cell, first before middle of cell, third and fourth bifurcating beyond centre of third, the fourth not reaching apex of wing; cell long and broad; lower median nervule emitted about centre of median nervure. Posterior wings ovate; the posterior margin strongly convex. Costal nervure arched and extending to apex of wing; subcostal nervules bifurcating before apex of cell. Body moderately slender. Palpi porrect, the second joint stout and compressed; apical joint slender, longest in the female; legs moderately long and slender, basal joint of the tarsi much elongated. Antennæ with a well-formed, prominent, and spatulate apical club.

This genus is quite distinct from *Pithecopis* (of which the type is the Javan species *P. hylax*), although similarity in colouring and markings has led to considerable confusion. In *Pithecopis* the first subcostal nervule is distinctly and strongly anastomosed with the costal nervure, in *Neopithecopis* that nervule is quite free and situate some clear distance from the costal nervure.

The geographical range of *Neopithecopis* (of which I take the type to be the Ceylonese species *N. dharma*, Moore) is at present unknown, and till all the species (many undescribed) which really belong to it are accurately determined little can be stated on that point. It is, however, known from Ceylon, I possess an undescribed species from the Andaman Islands, and it is probably distributed more or less throughout the Malayan Archipelago.

MAY 31, 1884.

3 H

1. *Neopithecops horsfieldi*,\* n. sp. (Tab. XXII., fig. 15 ♂.)

Male. Wings above dark purplish; anterior wings with the apex and outer margin distinctly and broadly darker; posterior wings with the fringe greyish-white. Wings beneath greyish-white; anterior wings with the following brownish markings, viz.:—an oblique line extending from costa to upper discoidal nervule, followed by a broken transverse linear fascia, a more continuous submarginal linear fascia between which and the outer margin are a series of linear spots, and an outer marginal line; posterior wings with a large blackish spot near apex, and brownish markings as on anterior wings. Body above and beneath more or less concolorous with wings; legs greyish-white, more or less annulated with brownish.

Exp. wings, 20 millim.

HAB.—Malay Peninsula; Singapore (Kerr).

I have as yet received but a single example of this species, obligingly sent to me by its captor, Capt. J. M. Kerr.

## Genus CYANIRIS.

*Cyaniris*, Dalman, Vetensk. Acad. Handl. xxxvii. 63, 94 (1816); Moore, Lep. Ceyl. i. p. 74 (1881).

*Lycanopsis*, Feld. Reise Nov. Lep. p. 257 (1865).

Anterior wings subtriangular, costal margin oblique, outer margin oblique and slightly convex, inner margin nearly straight; costal nervure terminating at about centre of costal margin; first subcostal nervule emitted a little beyond basal half of cell, second between base of first and end of cell, third and fourth bifurcating between end of cell and apex of wing; † cell long, narrow, extending to about half the length of wing; first and second median nervules emitted a short distance from each other at end of cell; third median nervule emitted a little beyond basal half of cell. Posterior wings subovate, costal and posterior margins convex; costal nervure extending to apex, first subcostal nervule emitted a little before the end of cell. Palpi porrect, second joint pilose, projecting half beyond the head, third slender and about half the length of second; legs well developed, femora moderately pilose; antennæ with a well-formed elongate club.

I can find no sufficient character to separate the proposed genus *Lycanopsis*, Feld., from *Cyaniris*. Felder himself appended to his diagnosis of the typical species the remark, "Erinnert auch in der Zeichnung der Unterseite an die Gruppe von *Lycæna Argiolus*, L.," and as Mr. Moore (*supra*) gives this species as the type of *Cyaniris*, there seems little doubt as to common identity.

I am only able at present to enumerate two species of *Cyaniris* in this fauna. Mr. Butler, in his paper on the "Butterflies of Malacca," ‡ included the *Lycæna cagaya*, Feld., a species which clearly appertains to this genus. Our artist, however, was unable to see this specimen at the British Museum, it being no longer placed under Felder's name, and was not then discoverable. I have not received it from the Malay Peninsula, and, as Felder described it from Luzon, it has probably been erroneously ascribed to Malacca.

\* This species is dedicated to the memory of the late Dr. Thomas Horsfield, whose name is inseparably connected with the Natural History of Java.

† Mr. Moore (Lep. Ceyl. i. p. 74) describes a fifth subcostal nervule emitted "from end of the cell," but in my view this is clearly the upper discoidal nervule.

‡ Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 1 (1878).



1. *Cyaniris lambi*.\* (Tab. XXI., fig. 22 ♂.)

*Polyommatus (Cyaniris) Lambi*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. x. p. 245 (1882).

Male. Wings above somewhat dark lavender-blue; anterior wings with the costal area and outer margin somewhat broadly fuscous, widest at base and apex; posterior wings with the costal, posterior, and abdominal margins somewhat broadly fuscous. Wings beneath greyish-white; anterior wings with the costal area and outer margins slightly infuscated, and with the following pale fuscous spots:—a transverse linear one at the end of cell, one between third and fourth subcostal nervules, one above upper discoidal nervule, three in linear series and nearer outer margin, divided by the lower discoidal and first median nervules, and two larger, and placed more inwardly, divided by the third median nervule; obscure, wavy and broken submarginal and marginal pale fuscous fasciæ. Posterior wings with seven large and prominent black discal spots—one, small, between bases of costal and subcostal nervules, followed by two which are more rounded and much larger, one in cell, at about base of third median nervule, near which is a smaller spot, contiguous, but outside cell, and two situate on abdominal margin; these are followed by a discal series of six pale fuscous spots, the first and innermost of which is situate between the subcostal nervules near their base, second and third on each side of discoidal nervule, and fourth, fifth and sixth in irregular series, separated by the second and third median nervules; a transverse pale fuscous fascia at end of cell, and a much-waved pale fuscous submarginal fascia, between which and outer margin are nine marginal spots, the upper four of which are pale fuscous, and the remaining five almost black. Body and legs more or less concolorous with wings.

Female. Anterior wings above fuscous, with a pale greyish-white discal space much suffused with bluish, extending from near base through centre of cell above, to about median nervule beneath, and outwardly reaching centre of submedian nervules. Posterior wings above pale fuscous, with a similar but smaller pale discal area as on anterior wings, and with the posterior margin fuscous as in male. Wings beneath as in the other sex.

Exp. wings, ♂ and ♀, 30 to 32 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (coll. Godfery); Sungei Ujong (Durnford); Malacca (coll. Godm. & Salv. and Biggs—coll. Dist.)—Nias Island (coll. Dist.).

*C. lambi* is most nearly allied to the Ceylonese species *C. lavenderis*, Moore.

2. *Cyaniris haraldus*. (Tab. XXI., fig. 6 ♂.)

*Papilio Haraldus*, Fabricius, Mant. Ins. ii. p. 82, n. 744 (1787); Ent. Syst. iii. p. 317, n. 201 (1793).

*Polyommatus Heraldus*, Godt. Enc. Méth. ix. p. 677, n. 188 (1823).

*Lycæopsis Ananga*, Feld. Reise Nov. Lep. ii. p. 257, n. 303, t. 32, f. 10, 11 (1865).

*Danis Haraldus*, Butl. Cat. Fabr. Lepid. p. 161, n. 1 (1869).

*Cupido Haraldus*, Kirby, Syn. Cat. Diurn. Lep. p. 347, n. 12 (1871).

*Cupido Ananga*, Kirby, Syn. Cat. Diurn. Lep. p. 376, n. 298 (1871).

*Lycæopsis Haraldus*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 546, n. 1 (1877).

Male. Wings above bright cærulean-blue; anterior wings with the costal margin narrowly and the apex and outer margin broadly blackish; posterior wings with the costal area beyond base creamy-white, the posterior margin blackish, and the abdominal margin creamy-white. Wings beneath creamy-white, anterior wings with the following blackish markings:—costal margin narrowly, and an outer series of somewhat

\* I have named this species after my late esteemed friend Mr. James Lamb, who some years ago collected most assiduously the Coleoptera of Province Wellesley. Two special memoirs have been published on portions of his collection, viz. "A Catalogue of Longicorn Coleoptera collected at Penang, &c.," by F. P. Pascoe (Proc. Zool. Soc. 1866), and "Notes on rare and descriptions of new species of Buprestidæ collected by Mr. James Lamb in Penang," by Edwd. Saunders (Trans. Ent. Soc. Lond. ser. 3, vol. v. 1867). The remainder of his collection still remains in this country, and the greater part practically unworked.

cruciform spots placed between the nervules, bounded on each side by a marginal and submarginal line, the last preceded by a disjointed series of linear streaks; posterior wings similarly marked as anterior wings, but with the series of spots larger and not cruciform.

Female. Wings above blackish, with a broad white fascia crossing the disk of both wings, commencing near the upper median nervule of the anterior wings, and continued across the posterior wings to about centre of abdominal margin. Wings beneath as in male.

Exp. wings, ♂ and ♀, 31 to 40 millim.

HAB.—Malay Peninsula; Malacca (Wallace—coll. Godm. & Salv.; Pinwill—Brit. Mus.; Biggs—coll. Dist. & Gosse).—Sumatra (Brit. Mus.).

This species varies greatly in size, and the female is on the upper surface of a most distinct and divergent character, closely resembling the general markings found in the genus *Castalius*. The female also appears to be at least difficult of capture, as it is rare in collections, and although I possess a specimen (unlocalised) I have never received it from the Malay Peninsula.

### Genus ZIZERA.

*Zizera*, Moore, Lep. Ceyl. i. p. 78 (1881).

Wings small. Anterior wings subtriangular, margins much as in *Cyaniris*; costal nervule extending to about half the length of wing; first subcostal nervule emitted at about half the length of cell and impinging midway on the costal nervule, remaining subcostal nervules as in *Cyaniris*; cell extending to about half the length of wing, its apical half broad. Other characters much as in *Cyaniris*, but with the legs less robust.

This is a genus of small and short-winged butterflies, principally differing from the preceding genus by the character and position of the first subcostal nervule of the anterior wings.

*Zizera* possesses a wide geographical area, indifferently known at present, but probably extending from Continental India, Ceylon, the Andaman and Nicobar Islands, throughout the Malay Peninsula, and through the length and breadth of the Malayan Archipelago.

Two species can only at present be enumerated as belonging to this fauna. Mr. Butler, in his paper on the "Butterflies of Malacca," included under the genus *Lycæna* the *Z. sangra*, Moore,\* as received from both Malacca and Penang. The specimen, however, could not be produced when our artist was at the British Museum, and consequently the species is omitted here. I think, however, that the *Z. pygmea*, Snellen,† must occur in the Peninsula, as it is recorded from Java, Sumatra, Ceylon, and, on the authority of Mr. Moore,‡ it was also collected at the N.W. Himalayan hill-station of Dharmsala by the Rev. J. H. Hocking.

#### 1. *Zizera lysizone*. (Tab. XX., fig. 9 ♂.)

*Lycæna Lysizone*, Snellen, Tijds. Ent. xix. p. 152, n. 49, t. 7, f. 2, 2a (1876); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 2 (1877).

Wings above pale violaceous; anterior wings with the costal area pale brownish, the outer margin (widest at apex) broadly dark brown; posterior wings with the costal area broadly pale brownish, the

\* Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 4 (1877).

† Tijds. Ent. xix. p. 153, t. 7, f. 3 (1876).

‡ Proc. Zool. Soc. 1882, p. 245.

posterior margin (narrowing to anal angle) dark brownish; fringe of both wings greyish, darker at base. Wings beneath pale brownish ochraceous; anterior wings with a linear brown spot margined with grey at end of cell, and a curved series of six brown spots margined with grey, placed between the nervules and situate midway between the end of cell and outer margin, the uppermost situate between the bifurcation of the third and fourth subcostal nervules, the sixth (sometimes duplex and sometimes absent) placed above the submedian nervure, the outer margin darker and containing two dark waved lines; posterior wings with a linear spot at end of cell as on anterior wings and with the following series of brown spots margined with grey:—three near base, two above and beyond cell, five midway between cell and posterior margin, the first situate beneath the lower subcostal nervule, the fifth before the submedian nervure, and a smaller spot about centre of abdominal margin; posterior margin darker and marked as on anterior wings. Body above and beneath more or less concolorous with wings.

Female. Wings above pale brownish, with a broad violaceous streak at base; wings beneath as in male.

Exp. wings, ♂ & ♀, 17 to 24 millim.

HAB.—Malay Peninsula; Sungei Ujong (Durnford); Malacca (Biggs—coll. Dist.; Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.).—Java; Batavia (Snellen).

I have, since figuring a small Malaccan male belonging to the collection of Mr. Moore, received a fine series of this species, which proves (as could be reasonably expected) that the species is subject to considerable variation both in size and in the distinctness of the markings on the under surface of the wings. It also appears to be a very abundant Lycænid in the Malay Peninsula.

## 2. *Zizera karsandra*. (Tab. XXII., fig. 22 ♀.)

*Polyommatus Karsandra*, Moore, Proc. Zool. Soc. 1865, p. 505, t. 31, f. 7; Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 235, n. 42 (1881).

*Lycana Karsandra*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 3 (1877).

I have not received this species from our region, and only know it by the female specimen in the British Museum, which was captured by Capt. Pinwill in Penang. The figure here given is taken from that specimen, and I add Mr. Moore's original description:—

“Upperside purple-brown. Underside greyish brown, exterior margins defined by a brown line: fore wing with a spot within discoidal cell, a disco-cellular streak, a spot above it, and a transverse discal series of six spots black, each encircled with white; a marginal and submarginal row of pale brown, white-bordered lunules: hind wing with a series of twelve black spots, and a pale disco-cellular streak, encircled with white; a marginal row of pale brown, whitish encircled spots, and a submarginal row of whitish lunules: cilia greyish brown.”

Exp. wings, “ $\frac{10}{12}$  inch.”

HAB.—Continental India; North-West Plains (Moore).—Nicobar Islands; Kamorta (Wood-Mas. and de Nic.).—Malay Peninsula; Penang (Pinwill—Brit. Mus.).

## Group CASTALARIA.

*Castalaria*, Distant, *antea*, p. 196.—

Although I am now only able to include eight genera in this group, such an enumeration gives but little idea of its generic strength, as it is widely and probably universally distributed.

## SYNOPSIS OF GENERA.

1. Posterior wings with a single filamentous tail-like appendage.
  - A. First subcostal nervule of anterior wings anastomosed with costal nervure.
    - a. First subcostal nervule of anterior wings emitted near middle of cell.
      - b. Costal nervure extending beyond basal half of costal margin. - - - - - CASTALIUS.
      - bb. Costal nervure not or barely reaching basal half of costal margin. - - - - - EVERES.
    - aa. First subcostal nervule of anterior wings emitted considerably beyond middle of cell. - - - - - NACADUBA.
  - AA. First subcostal nervule of anterior wings impinging on, or connected with, the costal nervure.
    - c. First subcostal nervule of anterior wings emitted at about middle of cell.
      - d. Third and fourth subcostal nervules of anterior wings bifurcating about midway between end of cell and apex of wing. - - - - - JAMIDES.
      - dd. Third and fourth subcostal nervules of anterior wings bifurcating at about two-thirds of the distance between end of cell and apex of wing. - - - - - CATOCHRYSOPS.
    - cc. First subcostal nervule of anterior wings emitted beyond middle of cell. - - - - - LAMPIDES.
  - AAA. First subcostal nervule of anterior wings not anastomosed with, nor impinging on, the costal nervure.
    - c. First subcostal nervule of anterior wings emitted at about middle of cell. - - - - - POLYOMMATUS.
2. Posterior wings with two short filamentous tail-like appendages.
  - cc. First subcostal nervule of anterior wings emitted considerably beyond middle of cell. - - - - - LYCENESTHES.



FIG. 62.—Anterior wing of *Castalius ebna*, showing subcostal nervules.



FIG. 63.—Anterior wing of *Jamides bochus*, showing subcostal nervules.



FIG. 64.—Anterior wing of *Polyommatus baticus*, showing subcostal nervules.

## Genus CASTALIUS.

*Castalius*, Hübner, Verz. bek. Schmett. p. 70 (1816); Moore, Lep. Ceyl. i. p. 82 (1881).

Anterior wings subtriangular; costal margin arched and slightly convex, outer margin moderately convex and sometimes slightly waved, inner margin somewhat concavely sinuate; costal nervure extending to a little beyond middle of costal margin; first subcostal nervule short, emitted a little beyond half of cell and anastomosed with costal nervure, second emitted close to base of first, third from a little before end of

\* I have previously acknowledged and laid stress on the artificiality, if expediency, of my proposed groups, formulated alone on superficial characters. The biological method of classification is now more thorough and accurate, based on the teachings of morphology and embryology; but even then, as recently pointed out by Dr. T. Margó, we must "regard all the different endeavours of systematists to group animals exclusively in accordance with one character, whether morphological, embryological, or biological, external or internal, as mere experiments—such a grouping or classification of animals can never be the true expression of their natural affinities."—"The Classif. Anim. Kingd., with reference to the newer Zool. Systems" (Eng. trans., Ann. & Mag. Nat. Hist. ser. 5, vol. xiii. p. 316).

cell, and fourth bifurcating from the third almost midway between end of cell and apex of wing; lower median nervule emitted a little beyond middle of median nervure. Posterior wings broadly subovate; costal and outer margins convex, the last with a delicate tail-like appendage at apex of lower median nervule; costal nervure arched and extending to apex, first subcostal nervule emitted a little before the end of cell. Palpi porrect, second joint long, thickly clothed with adpressed hairs, third joint very slender, about half the length of second; antennæ with a somewhat suddenly formed, robust, apical club.

*Castalius* is common to the Ethiopian and Oriental regions. In Africa and Asia it probably extends throughout the tropics, but the number and distribution of its species cannot be estimated at present with any degree of accuracy.

### 1. *Castalius rosimon*. (Tab. XXII., fig. 20 ♀.)

*Papilio Rosimon*, Fabricius, Syst. Ent. p. 523, n. 341 (1775); Sp. Ins. p. 121, n. 541 (1781); Mant. Ins. p. 71, n. 672 (1787); Ent. Syst. iii. p. 349, n. 327 (1793).

*Papilio Maimon*, Fabr. Syst. Ent. p. 534, n. 395 (1775).

*Papilio Clyton*, Cram. Pap. Ex. i. t. 67, F, G (1779).

*Papilio Coridon*, Cram. Pap. Ex. iv. t. 340, C—E (1782).

*Castalius Navus*, Hübn. Verz. bek. Schmett. p. 70, n. 696 (1816).

*Polyommatus Rosimon*, Godt. Enc. Méth. ix. p. 658, n. 141 (1823).

*Lycæna Rosimon*, Horsf. Cat. Lep. E.I.C. p. 71, n. 6 (1828); Snell. Tijd. Ent. xix. p. 152, n. 41 (1876).

*Cupido rosimon*, Druce, Proc. Zool. Soc. 1874, p. 106, n. 1; Snell. Tijd. Ent. xxi. p. 17 (1878).

*Lampides rosimon*, Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 235, n. 41 (1881); de Nic. *ibid.* p. 51, n. 42 (1881).

*Castalius Rosimon*, Butl. Cat. Fabr. Lep. p. 162, n. 1 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 546, n. 1 (1877); Moore, Lep. Ceyl. i. p. 83, t. 36, f. 2 (1881).

Male and Female. Wings above pearly white, basal areas covered with bright bluish-green scales. Anterior wings with the costal and outer margins broadly black, and with the following spots of the same colour:—one at base of lower median nervule (almost obscured by the basal bluish coloration), one, discocellular at apex of cell, and an irregular submarginal row of six spots, the uppermost of which is placed above the upper discoidal nervule, and the fifth and sixth are fused and traversed by the lower median nervule. Posterior wings with the costal margin (broadly) and two outer submarginal macular fasciæ black, and with the following spots of the same colour:—one between the subcostal nervules, another near apex of cell, one or two basal and almost hidden by the bluish coloration, two near the inner submarginal fascia and separated by the upper median nervule, and two placed a little above these and separated by the lower median nervule. Wings beneath pearly white; anterior wings spotted as above, but with a basal black streak running along costal nervure to first subcostal nervule, the costa only narrowly black or fuscous, and the outer margin with two submarginal rows of spots instead of the broad black margin as above; posterior wings spotted as above, the basal markings distinct, consisting of a basal streak and an oblique row of four spots, the marginal spots near anal angle irrorated with bluish scales. Fringe alternately grey and black. Body above blackish, beneath with legs more or less concolorous with wings.

NOTE.—The female has the black margins to the upper surface of the wings broader than in the male.

Exp. wings, ♂ and ♀, 27 to 30 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—coll. Moore); Sikkim (de Nic.).—Ceylon (Thwaites—coll. Dist.).—Nicobar Islands; Nankowri (Wood-Mas. & de Nic.).—Malay Peninsula; Penang (colls. Dist. & Godfy.); Malacca (Pinwill—Brit. Mus.).—Siam; Chentaboon and Nahconhaisee (Druce).—Java (Horsf.); Batavia (Snellen).—Celebes (Snellen).

This is evidently a widely distributed species, and the habitats given above must inadequately express its geographical distribution. According to Mr. Hutchison, as observed

at Colombo, it frequents "plains and borders of cultivated ground; at all times." "Slow flight; settles among grass and on the ground; easily captured."\*

## 2. *Castalius ethion*. (Tab. XXII., fig. 25 ♂.)

*Lycana Ethion*, Doubleday & Hewitson, Gen. Diurn. Lep. p. 490, t. 76, f. 3 (1852); Hewits. Exot. Butt. v.

Lyc. t. 1, f. 5 (1876); Snell. Tijd. Ent. xix. p. 152, n. 42 (1876).

*Cupido Ethion*, Druce, Proc. Zool. Soc. 1874, p. 106, n. 2.

*Castalius Ethion*, Moore, Proc. Zool. Soc. 1877, p. 587; Lep. Ceyl. i. p. 83, t. 36, f. 5, 5a (1881); Butl.

Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 2 (1877); Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 248, n. 49 (1881).

Male. Wings above pearly white. Anterior wings with the costal and outer margins fuscous, inwardly and broadly margined with pale resplendent bluish, which colour also occupies the whole base of wing, and leaves the pearly white ground-colour as an oblique fascia, commencing at the upper discoidal nervule, and suddenly narrowing beneath the second median nervule. Posterior wings with the posterior margin fuscous, inwardly broadly and irregularly margined with pale resplendent bluish, which colour also occupies base of wing.

Wings beneath pearly white, sometimes with bluish reflections, and outwardly tinged with pale ochraceous. Anterior wings with the costal and outer margins narrowly fuscous, and with the following markings of the same colour, viz.:—two oblique fasciæ near base, a short subapical fascia extending from costa to a little beneath lower discoidal nervule, a rounded spot on second median nervule, a broad short fascia extending from second median nervule to near inner margin, and two marginal series of spots placed between the nervules. Posterior wings with the following fuscous markings:—two short oblique basal fasciæ, a short transverse fascia extending from abdominal margin to second median nervule, a similar central one placed nearer margin, a short curved fascia near apex and two marginal series of spots placed between the nervules. Body above blackish, beneath more or less concolorous with wings; legs fuscous, with white markings; antennæ fuscous, annulated with greyish.

Female. Resembling the male, but without the resplendent blue coloration above.

Exp. wings, ♂ and ♀, 24 to 28 millim.

HAB.—Ceylon (Thwaites—coll. Dist.).—Andaman Islands (coll. Moore and Calcutta Mus.).—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.).—Sumatra (Forbes—coll. Dist.).—Java; Batavia (Snellen).—Siam; Nahconhaisce (Druce).

The habitats given above, though few in number, are still sufficient to show that this species is somewhat widely distributed.

## 3. *Castalius roxus*. (Tab. XXII., fig. 24 ♂.)

*Polyommatus Roxus*, Godart, Enc. Méth. ix. p. 659, n. 142 (1823).

*Lycana Roxus*, Horsf. Cat. Lep. E.I.C. p. 70, n. 5, t. 2, f. 4, 4a (1828).

*Cupido roxus*, Druce, Proc. Zool. Soc. 1873, p. 348, n. 3.

*Castalius roxus*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 3 (1877); Moore, Proc. Zool. Soc.

1878, p. 833; Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 248, n. 51 (1881).

Male. Wings above black; both wings crossed by a broad oblique white fascia, commencing near the lower discoidal nervule of the anterior wings, narrowed beneath the second median nervule and continued across the posterior wings to abdominal margin; posterior wings with a few small and somewhat obscure

\* Moore's Lepid. Ceyl. i. p. 83.

pale linear marginal spots. Wings beneath creamy white, with a broad black fascia commencing on costa of anterior wings near apex of cell and continued across base of posterior wings; anterior wings with a curved black fascia commencing on costa contiguous to the basal fascia and terminating near the middle median nervule, a short and broad fascia of the same colour extending from the middle median nervule to about inner margin, and the outer margin broadly black, containing a series of pale spots; posterior wings with three large irregular black spots beyond middle, the first near apex, the second nearer margin and bounded by the lower subcostal and middle median nervules, the third between the last-mentioned nervule and the abdominal margin; outer margin resembling that of anterior wings. Body above black, beneath more or less concolorous with wings; legs black, streaked and spotted with whitish; palpi white, their upper surface and apex black. Antennæ black, annulated with greyish.

Exp. wings, ♂, 25 to 28 millim.

HAB.—Andaman Islands (Calcutta Mus.)—Tenasserim (Limborg—coll. Moore).—Malay Peninsula; Perak (coll. Godfery); Sungei Ujong (Durnford—coll. Dist.); Malacca (Biggs—coll. Gosse).—Java (Horsf.).—Borneo (Lowe—coll. Godm. & Salv.); Sandakan (Pryer—coll. Dist.).—Philippine Islands; Mindanao (Challenger Exped.—Brit. Mus.).

Dr. Horsfield relates that in Java this species “occurs in considerable numbers on the skirts of large forests; but, from the great delicacy of the wings, it is not easily obtained in a perfect state.”\*

#### 4. *Castalius elna*. (Tab. XX., fig. 4.)

*Lycæna Elna*, Hewitson, Ex. Butt. V. Lye. t. 1, f. 8 (1876).

*Castalius Elna*, Moore, Proc. Zool. Soc. 1877, p. 587; Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 248, n. 50 (1881).

Male and Female. Wings above black, with an oblique white fascia commencing a little above the upper median nervule of the anterior wings, continued and gradually widened across posterior wings, and terminating on abdominal margin; the margins of this fascia being sinuate and irregular. Wings beneath creamy white, outwardly tinged with ochraceous, with a broad black fascia commencing on costa near end of cell, continued to median nervure, and then transversely deflected across posterior wing to base of abdominal margin. Anterior wings with the following black markings:—a large subapical spot extending from costa to a little beneath lower discoidal nervule, a large spot extending from second median nervule to inner margin, and an irregular outer marginal macular fascia. Posterior wings with the following black markings:—a somewhat rounded subapical spot, an irregular transverse macular fascia extending from discoidal nervule to abdominal margin, and a series of marginal subconical spots placed between the nervules, the extreme outer margin also black; fringe fuscous. Body above black, sides of abdomen annulated with grey; body beneath and legs more or less concolorous with wings; palpi black above, creamy white beneath; antennæ black, annulated with greyish.

Exp. wings, ♂ and ♀, 24 to 30 millim.

HAB.—Continental India; N.E. Himalaya (coll. Dist.); Darjeeling (coll. Hewits.).—Andaman Islands (Calcutta Mus.); Port Blair (Moore).—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Malacca (Biggs—coll. Dist. & Gosse); Singapore (coll. Hewits.).—Java (coll. Hewits.).

\* Cat. Lep. Ins. E. I. C. p. 70 (1828).

## Genus NACADUBA.

*Nacaduba*. Moore, Lep. Ceyl. i. p. 88 (1881).

Anterior wings subtriangular; costal margin moderately arched, outer margin more or less convex, inner margin nearly straight. Costal nervure extending to about half the length of the costal margin; first subcostal nervule emitted at about one-third before end of cell, and anastomosed with the costal nervure, second subcostal nervule emitted about midway between base of first and apex of cell, third emitted close to termination of cell, third and fourth bifurcating a little beyond middle of third. Cell broad, extending to more than half the length of the wing. Posterior wings subtriangular, costal margin moderately convex, posterior margin oblique and slightly convex, with a single slender tail-like appendage. Costal nervure arched and almost extending to apex, subcostal nervules bifurcating near end of cell; cell broad, first and second median nervules with an apparently common origin near end of cell. Body of moderate size and hairy; palpi porrect, the second joint extending more than half beyond the apex of head.

This genus having been so recently founded, and the number of species belonging to it being still uncatalogued, little can be said as to its geographical distribution, beyond the remark that it is probably a purely Oriental genus, and is generally distributed throughout that region. It is also certain that more species of *Nacaduba*, than the few now and here enumerated, remain to be discovered in the Malay Peninsula.

1. *Nacaduba macrophthalma*. (Tab. XX., fig. 3 ♂.)

*Lycæna Macrophthalma*, Felder, Verh. Zool. Bot. Gesch. 1862, p. 483; Reise Nov. Lep. ii. p. 275, t. 34. f. 35 (1865).

*Lampides macrophthalma*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 2 (1877); Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 235, n. 40 (1881).

*Nacaduba macrophthalma*, Moore, Lep. Ceyl. i. p. 89, t. 37, f. 4, 4 a (1881); de Nic. J. A. S. B. vol. LI. p. 62, n. 172 (1882).

Male. Wings above blue with strong violaceous reflections. Wings beneath greyish-brown; anterior wings with two whitish narrow disco-cellular fasciæ at end of cell, beyond which are two similar fasciæ extending from third and fourth subcostal nervules to middle median nervule, and a similar pair placed beneath and between these two series, extending from second median nervule to near inner margin; a marginal and two submarginal narrow whitish fasciæ and a small spot between second and third subcostal nervules. Posterior wings irregularly crossed by six narrow, more or less broken and sometimes fused whitish fasciæ, and a marginal and two submarginal (the innermost broadest) fasciæ of the same colour; a large black spot margined with ochraceous near anal angle, placed between the second and third median nervules, and a small streak of metallic bluish-green scales margined with black at anal angle. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 35 to 39 millim.

HAB.—Continental India; Sikkim (de Nic.); Darjeeling (coll. Dist.).—Ceylon (Thwaites—coll. Dist.).—Nicobar Islands; Pulo Milo (Felder).—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Philippine Islands; Mindanao (Challenger Exped.—Brit. Mus.).

This species was first described from specimens collected by Frauenfeld during the stay of the Novara Expedition at the Nicobar Islands. I have not received it myself from the Malay Peninsula, the figure being taken from an example in the British Museum, collected at Malacca by Capt. Pinwill. The female is also unknown to me.



2. *Nacaduba beroë*. (Tab. XX., fig. 17 ♂, 16 ♀.)

*Lycæna beroë*, Felder, Reise Nov. Lep. ii. p. 275, n. 340, t. 34, fig. 36 (1865).

*Lampides beroë*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 3 (1877).

I have here figured two Malaccan specimens contained in the British Museum, and identified as belonging to Felder's species by Mr. Butler. The following is the original diagnosis:—

“♂. Alæ supra plumbeo-violaceæ, striga anteciliari nigro-fusca, subtus pallide cano-brunneæ, fasciis binis macularibus fuscis, albo cinctis, connatis ante marginem, anticarum fascia subbasali, costam pertingente, macula subcostali, fasciola discocellulari fasciaque exteriore, catenulari apud ramum medianum secundum fracta, posticarum fascia basali, fasciola discocellulari fasciaque exteriore apud ramum medianum secundum contigua, antice bis fortiter—et postice fracta, catenulari fundi coloris, lateraliter fusco cinctis alboque marginatis, posticæ macula postica orbiculari, circulo lutescento intus amplexa, extus areu tenui metallico divisa maculisque binis analibus minutis, metallico lutescentique intus limbulatis atris.”

Exp. wings, ♂ and ♀, 27 to 28 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Philippine Islands; Luzon (coll. Feld.).

This species seems to be very closely allied to *N. atrata*,\* Horsf. (nec. Cram.), and so again with the equally similar form described as *N. prominens*, Moore.† Horsfield's species, however, appears to be distinct by the colour pattern of the wings of the female “transmitting a white patch on the disk.”

3. *Nacaduba viola*. (Tab. XX., fig. 24 ♂.) ‡

*Lampides viola*, Moore, Ann. & Mag. Nat. Hist. ser. 4, vol. xx. p. 340 (1877); Lep. Ceyl. i. p. 89, t. 38, f. 1, 1a, b (1881).

Male. Wings above dark violet-blue, with a slender black marginal line and the fringe pale fuscous. Wings beneath greyish-brown; anterior wings crossed by the following narrow greyish fasciæ arranged in pairs, viz.:—two crossing cell and continued beneath it, two short and disco-cellular at end of cell, two between end of cell and apex of wing (the innermost terminating at central median nervule), and a pair situate between the last two series commencing at upper median nervule and continued to near abdominal margin, and a marginal and two submarginal narrow greyish fasciæ. Posterior wings crossed very irregularly by about six narrow and broken fasciæ, as on anterior wings, and a narrow marginal and two much-waved similar submarginal fasciæ; a large black marginal spot margined with dark ochraceous and speckled with metallic greenish, between second and third median nervules, and a somewhat similarly coloured anal angular streak. Body above and beneath more or less concolorous with wings.

Female. This sex is figured by Mr. Moore in the ‘Lepid. Ceyl.’, and described as “dark violet-brown, smalt-blue on middle of the forewing; hindwing with indistinct marginal row of pale-bordered black spots, the penultimate spot most distinct.”

\* *Lycæna atrata*, Horsf. “Cat. Lep. E. I. C. p. 78, n. 13.

† Ann. & Mag. Nat. Hist. ser. 4, vol. xx. p. 341 (1877).

‡ The figure here given is very unsatisfactory, if not quite misleading. At the time when the plate was executed I had not received the species from the Malay Peninsula, and was indebted to Mr. Moore for the loan of a Malaccan specimen to figure. This specimen was a much rubbed one, and hence our artist, in his effort to conscientiously portray the species, has rendered the upper surface of the wings too strongly shaded with brown. Mr. Moore's figures of the male in the ‘Lep. Ceylon’ is equally unsatisfactory, not showing the markings beneath. I have therefore added a good woodcut.



FIG. 65.—*Nacaduba viola* ♂.

Exp. wings, 24 millim.

HAB.—Ceylon (coll. Moore).—Malay Peninsula ; Malacca (coll. Moore).—Singapore (Kerr—coll. Dist.).

There is a slight variation in this species in the exact correspondence or fracture of the narrow greyish fasciæ on the under surface of the wings, and it may be as well to state, once for all, that the systematist who expects to find rigidity of pattern in the *Lycenidae*—where such narrow and divergently arranged fasciæ exist—will be disappointed. In this genus, and in several following genera, where a somewhat similarity of pattern prevails, such variability in the markings of the species will be found, whilst sometimes a slight alteration of the ground colour from greyish-brown to brownish-grey gives one an impression of dealing with seasonal variation in that respect.

4. *Nacaduba aluta*. (Tab. XX., fig. 14 ♂ and 13 ♀.)

*Cupido aluta*, Druce, Proc. Zool. Soc. 1873, p. 349, t. 32, f. 8.

*Lampides aluta*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 4 (1877).

*Nacaduba aluta*, Butl. Ann. & Mag. Nat. Hist. ser. 5, vol. xi. p. 417, n. 58 (1883).

Of this species I have figured a male and female specimen collected by Capt. Pinwill in Malacca, and now contained in the British Museum. I have since received a female example, but of the male can only give the description of Mr. Druce:—

Male. “Upperside dark lavender-blue ; outer margins brown.”

“Underside pale brown, both wings crossed by nine broken white lines ; an orange spot at the anal angle, with a black centre.”

Female. Wings above fuscous-brown ; anterior wings with a discal patch of bluish scales, the outer margin darker ; posterior wings with the posterior margin darker and inwardly margined with greyish, before which are a marginal row of dark spots placed between the nervules ; fringe brownish ochraceous. Wings beneath somewhat bright ochraceous, with the markings as in the other sex, but with the marginal row of dark spots to the upper surface of the posterior wings distinct beneath ; the black spot near the anal angle with a few scattered greenish scales.

Exp. wings, ♀ 20 millim.

HAB.—Malay Peninsula ; Sungei Ujong (Durnford—coll. Dist.) ; Malacca (Pinwill—Brit. Mus.).—Borneo (Lowe—coll. Godm. & Salv.).—Philippine Islands ; Mindanao (Challenger Exped.—Brit. Mus.).

The following two species appertain to the genus, but at present are not properly identified:—

5. *Nacaduba almora*? (Tab. XX., fig. 22.)

*Cupido almora*, Druce, Proc. Zool. Soc. 1873, p. 349, n. 14, t. 32, f. 7.

*Lampides almora*? Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 5 (1877).

This species was doubtfully inserted by Mr. Butler, in his paper on the Butterflies of Malacca, on the strength of a male specimen collected by Capt. Pinwill. The figure here given is taken from that specimen, and only partially agrees with Mr. Druce's figure of the Bornean type, as will be understood by the original description here given:—

"Upperside pale brownish blue, with two black spots at the anal angle, and a narrow black line round the outer margin of posterior wing."

"Underside very pale brown, streaked and mottled with white. Black spots as above."

Exp. wings, "1½ inch."

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Borneo (Druce).

## 6. *Nacaduba* sp.? (Tab. XXI., fig. 7 ♀.)

I have received three female specimens of this species, all more or less varying in the markings beneath, and as I am still without the other sex I refrain from precise identification for the present. It is clearly somewhat closely allied to the *N. kankena*, Feld.\*

## Genus EVERES.

*Everes*, Hübner, Verz. bek. Schmett. p. 69 (1816); Moore, Lep. Ceyl. vol. i. p. 85 (1881).

*Everes* is closely allied to the two preceding genera. From *Castalius*, although so different in colour and markings, it is really only structurally differentiated by the length of the costal nervure; whilst from *Nacaduba*, to which it is more superficially allied, the position of the first subcostal nervule is alone sufficient to distinguish it.

The extent of this genus is at present undetermined, and therefore we can only say that its area embraces (but is probably not confined to) Southern and Central Europe, and eastward throughout the Oriental region.

## 1. *Everes parrhasius*.

*Hesperia Parrhasius*, Fabricius, Ent. Syst. iii. p. 289, n. 108 (1793).

*Papilio Parrhasius*, Donovan, Ins. Ind. t. 45, f. 5 (1800).

*Lycæna Parrhasius*, Horsf. Cat. Lep. E. I. C. p. 86, n. 20 (1829).

*Lampides Parrhasius*, Butler, Cat. Fabr. Lep. p. 165, n. 12 (1869); Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 234, n. 33 (1881); *ibid.* p. 58 n. 58 (1881).

*Cupido Parrhasius*, Snell, Tijd. Ent. xxi. p. 19, n. 85 (1878).

*Everes Parrhasius*, Moore, Lep. Ceyl. vol. i. p. 85, t. 36, f. 7 (1881).

Male. Wings above violet-blue; anterior wings with the outer margin broadly dark fuscous, the costal margin narrowly of the same colour; posterior wings with the costal, outer and abdominal margins somewhat broadly dark fuscous, with two large and prominent marginal black spots inwardly bordered with reddish ochraceous outwardly with greyish and placed between the median nervules, a much more obscure spot between the upper median and the discoidal nervules, and a black macular streak bordered with greyish at anal angle; fringe of both wings fuscous tipped with grey; tail-like appendage black, with the apex greyish-white. Wings beneath creamy-grey; anterior wings with a slight and faint tawny tinge along the costal margin and at apex, and with the following brownish linear spots, margined with pale greyish:—one disco-cellular at end of cell, a series of five or six almost continuous crossing disk a little beyond middle, and two submarginal and connected series, extreme margin dark brownish, fringe brownish, tipped with grey; posterior wings with four prominent black spots (two on costal margin, one



FIG. 66.—*Everes parrhasius*, ♂.

\* *Lycæna Kankena*, Feld. Verh. Zool. Bot. Ges. xii. p. 481, n. 106 (1862); Reise Nov. Lep. ii. p. 270, n. 331, t. 34, f. 37 (1865).

in cell, and one on abdominal margin), and the following brownish linear spots margined as on anterior wings:—one disco-cellular, a series of six crossing disk beyond middle, and of which the central four are nearly continuous, two submarginal and connected series, which beyond the discoidal nervule are merged in three very large and contiguous reddish ochraceous spots, each containing a smaller pyramidal black spot on which are a few metallic-green scales, and two small transverse linear black spots at anal angle; extreme margin and fringe as on anterior wings. Body and legs more or less concolorous with wings.

Female. Wings above paler and more obscure violaceous-blue; anterior wings with very broad fuscous costal and outer margins; posterior wings with a very broad fuscous costal margin, and with a distinct marginal row of black spots margined with greyish, the two spots separated by the median nervules inwardly margined with reddish ochraceous. Wings beneath as in male.

Exp. wings, ♂ and ♀, 24 to 30 millim.

HAB.—Continental India; Sikkim (Calcutta Mus.); N.E. Himalaya (coll. Dist.).—Ceylon (Thwaites—coll. Dist.).—Nicobar Islands; Nankowri (Wood-Mas. & de Nic.).—Malay Peninsula; Malacca (Biggs—coll. Dist.); Singapore (Kerr—coll. Dist.).—Java (coll. Horsf.).—Celebes (Snellen).

I did not receive this species in time to have it lithographed with the other members of the family, but the woodcut will be quite sufficient—if the description is also consulted—to at once determine this well-marked Lycopid. Its geographical range is doubtless far wider than I have been at present able to determine.

### Genus JAMIDES.

*Jamides*, Hübner, Verz. bek. Schmett. p. 71 (1816); Moore, Lep. Ceyl. i. p. 86 (1881).

Anterior wings subtriangular; costal margin moderately convex, the apex obtusely acute, outer margin obliquely convex, inner margin slightly concavely sinuate; costal nervure somewhat abruptly directed to costa at about its centre; first subcostal nervule emitted a little beyond middle of cell, angulated and impinging on costal nervure at a short distance from its apex, second emitted at about one-third before end of cell, third nearer to end of cell than to base of second, third and fourth bifurcating almost midway between end of cell and apex of wing; cell extending to about half the length of wing; lower median nervule emitted a little beyond middle of median nervure. Posterior wings subovate, posterior margin provided with a slender tail-like appendage at apex of lower median nervule; cell short and broad, second median nervule emitted just before the end of cell. Palpi porrect, second joint robust and hirsute, projecting half way beyond the head, apical joint slender, about half the length of second; legs moderately robust; antennæ with a well-formed and curved club.

This genus is, according to present knowledge, only represented by one species in the Malay Peninsula, and as *Jamides* is apparently a small genus we cannot expect to find many more members of it in this fauna.

#### 1. *Jamides bochus*, var. (Tab. XXI., fig. 19 ♂, 16 ♀.)

*Papilio Bochus*, Cramer, Pap. Exot. iv. t. 391, C, D (1782).

*Hesperia Democritus*, Fabr. Ent. Syst. iii. p. 285, n. 94 (1793).

*Hesperia Plato*, Fabr. Ent. Syst. iii. p. 288, n. 103 (1793).

*Jamides Bochus*, Hübner, Verz. bek. Schmett. p. 71 (1816); Moore, Lep. Ceyl. vol. i. p. 86, t. 36, f. 8, 8a (1881).

*Lycæna Nila*, Horsf. Cat. Lep. E. I. C. p. 78 (1829).

*Lampides Plato*, Butl. Cat. Fabr. Lepid. p. 166, n. 18, t. 2, f. 3 (1869).

*Lampides Democritus*, Butl. Cat. Fabr. Lepid. p. 167, n. 19 (1869); Proc. Zool. Soc. 1880, p. 667, n. 13.

*Lampides plato*, var. *nicobaricus*, Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 234, n. 34 (1881).

Male. Wings above bright metallic-blue; anterior wings (excepting a basal space occupying the lower half of wing beneath cell, and not extending beyond extremity of cell) black; posterior wings with the costal, outer and abdominal margins black, and with some indistinct anal-angular spots. Wings beneath pale brownish; anterior wings crossed on outer half by two series of greyish linear fasciæ, which terminate near the upper median nervule, and are then continued by a third series which commences between them and terminates near inner margin, and with a marginal and two submarginal series of greyish linear fasciæ. Posterior wings with two series of irregular and broken greyish linear fasciæ, which are apparently arranged in subbasal and discal series; a third series beyond disk, two submarginal waved linear fasciæ and a narrow marginal fascia of the same colour; a large black marginal spot bordered with reddish-ochraceous between the first and second median nervules and a smaller spot of the same colour irrorated with bluish scales at anal angle. Body above and beneath more or less concolorous with wings.

Female. Wings above bright but non-metallic blue; anterior wings with the costal and outer margins broadly (broadest at apex) blackish; posterior wings with the costal and abdominal margins fuscous, the posterior margin narrowly black, with two submarginal waved fuscous linear fasciæ, and a large marginal black spot inwardly bordered with bluish between second and third median nervules. Wings beneath paler in hue, but marked as in male.

Exp. wings, ♂ 22 to 27 millim.; ♀, 28 to 32 millim.

HAB.—Continental India; Bombay, Sikkim, Calcutta (Wood-Mas. & de Nic.).—Ceylon (Thwaites—coll. Dist. and Brit. Mus.).—Nicobar Islands; Nankowri, Kamorta, Trinkut, Katschall (Wood-Mas. & de Nic.).—Malay Peninsula; Province Wellesley (coll. Dist.).—Formosa (Brit. Mus.).

This is a variable species, especially in the male sex. The male specimen here described and figured differs from the typical form of the species in the greater amount of melanism, or increase of the black coloration to the anterior wings; whilst the variety *nicobaricus*, described by Messrs. Wood-Mason and de Nicéville, varies contrariwise by the greater extent of the blue area. Only one male specimen having been collected it will remain to be discovered whether this varietal male form is of a constant or local character in the Malay Peninsula, as the females are indistinguishable from Ceylonese examples.\*

### Genus CATOCHRYSOPS.

*Catochrysops*, Boisduval, Voy. Astrolabe, Lep. p. 87 (1832); Moore, Lep. Ceyl. i. p. 90 (1881).

Anterior wings subtriangular, costal margin moderately arched, outer margin convex, inner margin nearly straight. First subcostal nervule emitted about middle of cell, impinging on and slightly touching the costal nervule, second emitted nearer to base of first than from base of third, third and fourth bifurcating at about two-thirds the length of third; cell extending to about half the length of wing; lower median nervule emitted near middle of cell, the two upper somewhat close together. Posterior wings subovate, costal margin strongly arched at base and then oblique to apex, posterior margin convexly

\* The variation in one sex of this species is of a very perplexing character, if we endeavour to bring any of the modern explanations to bear upon the point. Thus in the Nicobars a pale variety appears to have become representative, whilst in the island of Ceylon the species agrees with the form found in Continental India, so that insular causes cannot be the sole factor. In the Malay Peninsula a melanic change has ensued, but again only in the male sex. Whether this may be due to "Phytophagic" variation, or the effects consequent upon a change of food-plant in the larval condition, as proposed by Mr. B. D. Walsh (Proc. Ent. Soc. Philad. vol. iii. pp. 403—430), is at least an interesting conjecture, and one to be solved by the local lepidopterist. That species do vary and assume local forms must be to the knowledge of every naturalist who has worked at a widely distributed group, and the erection of new specific names founded more upon the separation of locality than the difference of character, threatens in the near future to become one of the greatest hindrances to the philosophical study of Entomology. Mr. Wollaston has pointed out how the Maderian specimens of *Lycæna phleas*, Linn., "are invariably darker and more suffused than the English ones" ('On the Variation of Species,' p. 34).

rounded, with a single slender tail-like appendage at apex of lower median nervule; costal nervule strongly arched and extending to near apex, first subcostal nervule emitted at about one-fourth before the end of cell; first and second median nervules with an apparently common origin at end of cell, third from about centre of cell. Palpi porrect, second joint broadly squamose, third joint long and slender. Antennæ with a well-formed apical club which is excavated beneath.

This genus is widely distributed: from Continental India, it extends throughout the Malayan Archipelago, and has been generally found among the islands of the Southern Seas. At present only three species can be here enumerated.

1. *Catochrysops strabo*. (Tab. XXI., fig. 8 ♂, 14 ♀.)

*Hesperia Strabo*, Fabricius, Ent. Syst. iii. p. 287, n. 101 (1793).

*Polyommatus Strabo*, Godt. Enc. Méth. ix. p. 656, n. 134 (1823).

*Lycana Kandarpa*, Horsf. Cat. Lep. E. I. C. p. 82, n. 17 (1829).

*Catochrysops Strabo*, Boisd. Voy. Astr. Lep. p. 88 (1832); Moore, Lep. Ceyl. vol. i. p. 91, t. 37, f. 2, 2a (1881).

*Lampides Strabo*, Butl. Cat. Fabr. Lep. p. 165, n. 14 (1869); Proc. Zool. Soc. 1880, p. 667, n. 12; Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 234, n. 32 (1881); *ibid.*, p. 248, n. 53 (1881).

*Cupido Strabo*, Druce, Proc. Zool. Soc. 1874, p. 106, n. 3; Snell, Tijd. Ent. xxi. p. 18, n. 82 (1878).

*Lycana Strabo*, Snell. Tijd. Ent. xix. p. 152, n. 46 (1876).

Male. Wings above pale lavender-blue, the outer margins narrowly dark fuscous, the fringe pale fuscous, with the tips greyish-white; posterior wings with a large black marginal spot between the second and third median nervules, a narrow transverse black streak bordered with greyish at anal angle, the abdominal margin bluish-grey, the tail-like appendage black with the apex white. Wings beneath very pale greyish-brown, with the following linear greyish-white fasciæ arranged in pairs:—anterior with two disco-cellular at end of cell, two extending from fourth subcostal nervule to middle median nervule, beneath which, contiguous to their inner margin, are two extending to inner margin, and a marginal and two submarginal somewhat waved linear fasciæ of the same colour; posterior wings with two at end of cell, two very irregularly waved and broken crossing wing beyond middle, and marginal and waved submarginal fasciæ, two small greyish margined spots near base, one in cell and one beneath median nervule, a large black marginal spot, containing a few scattered greenish scales and inwardly and broadly margined with ochraceous between second and third median nervules, some transverse black spots also inwardly margined with ochraceous at anal angle, and with two blackish spots margined with greyish beneath the costal nervule. Body and legs more or less concolorous with wings.

Female. Wings above pale brownish; anterior wings with the disk more or less bright violaceous-blue, beyond which there are indications of a double submarginal series of waved and broken greyish linear fasciæ, becoming quite obsolete towards apex; posterior wings with a distinct double submarginal series of waved and broken greyish linear fasciæ, with a large marginal black spot inwardly and very broadly margined with ochraceous situate between the second and third median nervules, and a series of more or less distinct dark marginal spots. Wings beneath as in male.

Exp. wings, ♂ and ♀, 26 to 32 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—coll. Moore).—Ceylon (Thwaites—coll. Dist.).—Andaman Islands (Wood-Mas. & de Nic.).—Nicobar Islands; Nankowri, Trinkut, Kamorta, Takoin (Wood-Mas. & de Nic.).—Burma; Moulmein (Brit. Mus.).—Malay Peninsula; Penang, Province Wellesley (coll. Dist.).—Perak (Townsend—coll. Godm. & Salv.); Malacca (Biggs—coll. Dist.); Singapore (Kerr—coll. Dist.).—Java; Batavia (Snell.).—Celebes (Snell. & coll. Dist.).—Philippine Islands; Mindanao (Challenger Exp.—Brit. Mus.).—Siam; Nahconchaisee (Druce).—Formosa (Brit. Mus.).

This widely distributed species seems little affected by modifying agencies, as it appears quite constant in form and colour, though the figure given by Mr. Moore as of a Ceylonese female specimen\* is certainly brighter and dissimilar to any examples that have passed through my hands. The same author has also described, under the name of *C. lithargyria*, a closely allied form or species from Ceylon, which I have also received from that island, but at present from no other locality.

## 2. *Catochrysops cnejus*. (Tab. XXI., fig. 2 ♂.)

*Hesperia Cnejus*, Fabricius, Ent. Syst. Suppl. p. 430 (1798).

*Polyommatus Cnejus*, Godt. Enc. Méth. ix. p. 657, n. 135 (1823).

*Lycana Cnejus*, Horsf. Cat. Lep. E. I. C. p. 83, n. 18 (1829); Herr.-Schäff. Stett. Ent. Zeit. 1869, t. 4, f. 18; Ex. Schmett. ii. f. 120 (1869).

*Lycana Patala*, Koll. Hüg. Kasehm. iv. 2, p. 419 (1848).

*Lycana Samoa*, Herr.-Schäff. Stett. Ent. Zeit. 1869, p. 73, n. 30.

*Lampides Cnejus*, Butl. Cat. Fabr. Lep. p. 165, n. 13 (1869); Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 235, n. 36 (1881).

*Cupido Cnejus*, Druce, Proc. Zool. Soc. 1873, p. 348, n. 7.

*Catochrysops Cnejus*, Moore, Lep. Ceyl. i. p. 92 (1881); Butl. Proc. Zool. Soc. 1881, p. 605, n. 15.

*Lampides patala*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 1 (1877).

Male. Closely allied to *C. strabo*, but more violaceous above, with the bases of the wings bluish, and the posterior wings with two marginal black spots inwardly bordered with ochraceous situate on each side of the lower median nervule. Wings beneath also closely resembling those of *C. strabo*, but the ground colour slightly darker, the markings narrower, and the colour between the greyish linear fascia distinctly darker and pale brownish; anterior wings with an almost continuous series from fourth subcostal nervule to inner margin, and not broken at middle median nervule as in *C. strabo*; posterior wings also differing from that species in having a third black spot margined with greyish in cell, a fourth smaller and less distinct on abdominal margin and in having two large black spots containing a few scattered greenish scales inwardly margined with ochraceous at anal angle, separated by the third median nervule.

Female. I have not seen this sex. Mr. Moore describes (but not figures) it as follows:—"violet-brown, with the lower basal and discal areas pale blue; hind wings with a bluish white-bordered black row of marginal spots, and an inner row of white lunules, the two anal spots red-bordered." †

Exp. wings, ♂, 28 to 30 millim.

HAB.—Continental India; Kurrachee (Swinhoe—Brit. Mus.); N.W. Himalaya (Hocking—coll. Moore).—Nicobar Islands; Kamorta (Wood-Mas. & de Nic.).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.).—Java (coll. Horsf.).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).

This does not appear to be an abundant species in the Malay Peninsula, as a single specimen captured by myself in Province Wellesley is the only example I have seen from that habitat, with the exception of that contained in the collection made by Capt. Pinwill in Malacca.

## 3. *Catochrysops pandava*. (Tab. XXI., fig. 17 ♂.)

*Lycana Pandava*, Horsfield, Cat. Lep. E. I. C. p. 84, n. 19 (1829).

*Catochrysops Pandava*, Moore, Lep. Ceyl. vol. i. p. 92, t. 37, f. 1, 1a, b (1881).

Male. Wings above bright lavender-blue; anterior wings with the outer margin fuscous; posterior wings with the costal margin fuscous, outer margin with a series of blackish spots placed between the

\* Lep. Ceyl. vol. i. t. 37, f. 2a.

† Ibid. vol. i. p. 92.

nervules, between which and the narrow black margin is a slightly undulating white line, tail-like appendages\* blackish, with their apices white; fringe of both wings fuscous, the tips greyish-white. Wings beneath pale greyish-brown, with the following narrow greyish-white linear fasciæ arranged in pairs, and between which the colour is distinctly darker:—anterior wings with two disco-cellular at end of cell, followed outwardly by two crossing wing from near fourth subcostal nervule, which are abruptly broken and deflected inwardly beneath both the middle and lower median nervules, two broad submarginal and one narrow marginal; posterior wings with two disco-cellular at end of cell, two crossing wing broken and deflected at the lower subcostal and median nervules, two lunulated and submarginal and one straight marginal, the last coalescing with the outer submarginal and thus enclosing a series of dark spots, a large black marginal spot with a few greenish scales between the second and third median nervules and some smaller spots of the same colour at anal angle; these spots inwardly margined with reddish-ochraceous, which colour is also slightly continued between the first and second median nervules, five black spots surrounded with greyish-white, situate two between the costal nervure, one in cell, one between the bases of the third median nervule and submedian nervure, and one (smaller) near base of abdominal margin. Body and legs more or less concolorous with wings.

Female. I do not at present know this sex. Mr. Moore has thus described† a female Ceylonese specimen:—“violet-brown, with the lower basal and discal areas glossy lavender-blue; hind wing with a marginal row of white-bordered black spots, and bluish-white inner lunular line, the penultimate spot red-bordered.”

Exp. wings, ♂, 30 millim.

HAB.—Continental India; N.E. Himalaya (coll. Dist.).—Ceylon (Thwaites).—Malay Peninsula; Province Wellesley (coll. Dist.).—Java (coll. Horsf.); Bantam (coll. Dist.).

The larva is figured in Moore's 'Lep. Ceyl.,' ‡ from a drawing of the Bros. de Alwis, and is thus described:§—“Larva onisciform; greenish or violet-brown above, with a dorsal darker brown line and white spots, and a yellow lateral line.”

“Pupa violet-brown, thick, head truncate.”

“Feeds on *Cycadaceæ* || (Thwaites).”

### Genus LAMPIDES.

*Lampides*, Hübner, Verz. bek. Schmett. p. 70 (1816); Moore, Lep. Ceyl. vol. i. p. 94 (1881).

This genus is closely allied to *Catochrysops*, and only or principally differs in having the first subcostal nervule of the anterior wings emitted beyond the middle of the cell; the third and fourth subcostal nervules bifurcating about midway between the end of cell and apex of wing. In *Lampides*, also, the first subcostal nervule is well removed from the costal nervure at its base, and is then suddenly and somewhat broadly connected with that nervure by a transverse spur.

This is a widely distributed genus, its area probably conterminable with that of *Catochrysops*.

#### 1. *Lampides elpis*. (Tab. XXI., fig. 25 ♂ and 26 ♀.)

*Polyommatus Elpis*, Godart, Enc. Méth. ix. p. 654, n. 125 (1823).

*Lycena Elpis*, Horsfield, Cat. Lep. E. I. C. p. 76, n. 11, t. 1, f. 4 (1828); Horsf. & Moore, Cat. Lep. Mus. E. I. C. p. 24, n. 18 (1857); Snell, Tijds. Ent. xix. p. 152, n. 44 (1876).

*Lampides elpis*, Moore, Proc. Zool. Soc. 1878, p. 833; Lep. Ceyl. vol. i. p. 95, t. 38, f. 4, 4a (1881); Wood-Mas. & de Nic. J. A. S. B. vol. xlix. p. 230, n. 38 (1880); de Nic. *ibid.* vol. l. p. 52, n. 44 (1881).

\* Mutilated in the specimen figured.

† Lep. Ceyl. vol. i. p. 92.

‡ T. 37, f. 1b.

§ Vol. i. p. 92.

|| Mr. Grant Allen considers the cycads, “whose inflorescence is the very simplest of all known flowering plants,” as a good example of the existing Gymnosperms, which “may be regarded as living survivors of a great class, once dominant, but now nearly extinct; and their flowers probably still preserve for us the original type of all blossoms, very slightly altered by time and circumstances” (‘The Colours of Flowers,’ p. 6).



Male. Wings above bright shining azure-blue, through which the pale markings beneath are faintly visible; anterior wings with the costal margin narrowly and the outer margin more broadly fuscous; fringe fuscous, the extreme tips paler; posterior wings with the costal area pale fuscous; posterior margin with a very pale fuscous and slightly waved submarginal linear fascia and a marginal row of fuscous spots placed between the nervules, and outwardly followed by a whitish line, the spot at anal angle linear and transverse, extreme outer margin fuscous, and fringe as on anterior wings. Wings beneath greyish-brown, crossed by the following series of whitish linear fasciæ arranged in pairs; anterior wings with two commencing near upper end of cell and terminating on submedian nervure, outwardly followed by two commencing a little beneath costa and terminating the inner one on middle median nervule and the outer one on upper median nervule, and two submarginal and one marginal; posterior wings with the disk crossed by three pairs more or less broken, and two waved submarginal and one marginal, these last broken between second and third median nervules by a large black marginal spot inwardly bordered with ochraceous, a linear spot at anal angle as above also slightly inwardly margined with ochraceous; extreme outer margin of wings fuscous; body above more or less concolorous with wings, lateral margins of abdomen greyish-brown, with the segmental incisures greyish-white; body beneath greyish-white; legs fuscous, more or less annulated with greyish, femora beneath wholly greyish.

Female. Wings above paler than in the male, with the costal and outer margin (especially at apex) of anterior wings broadly fuscous; the posterior wings with the outer marginal fasciæ and spots larger and more distinct. Wings beneath as in male, but with the ochraceous bordering of the anal and subanal spots larger and more diffused.

Exp. wings, ♂ 30 to 34 millim.; ♀ 29 to 35 millim.

HAB.—Continental India; Sikkim (de Nicéville).—Ceylon (Thwaites—coll. Dist.).—Andaman Islands (Wood-Mas. & de Nic.).—Tenasserim; Ahsoun, Meetan (Limborg—coll. Moore).—Malay Peninsula; Perak (Townsend—coll. Godm. & Salv.); Malacca (Biggs—coll. Dist.).—Java (coll. Horsf.); Batavia (Snellen).—Borneo; Sandakan (Pryer—coll. Dist.).

Var. *pseudelpis*. (Tab. XX., fig. 27 ♂, and 28 ♀.)

*Lampides pseudelpis*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 9, t. 68, f. 7, 8 (1878); Moore, Lep. Ceyl. i. p. 95 (1881).

I cannot look upon this proposed species as exhibiting anything but a varietal character or form of *L. elpis*. The figures I here give are copied from those of Mr. Butler, which I think are in some respects inexact, as the female should exhibit a fuscous costal margin, whilst the ground colour of the wings is too green in hue. I have formed this opinion from specimens which I have received since the figures were copied, and I add Mr. Butler's description, which lends reasonableness to the view:—

“Nearly allied to *L. elpis*, which it resembles above; below, however, with the white transverse bands narrower, irregular and broken up, the ground colour more distinctly bluish opaline, and the large submarginal black spot of secondaries less broadly encircled by ochreous.”

Exp. wings, “1 inch 6 lines.”

HAB.—Ceylon (Moore).—Malay Peninsula; Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.).—Java; Bantam (Forbes—coll. Dist.).

Mr. de Nicéville has observed this species in Sikkim, and found that “on the wing it presents a very curious appearance on account of its alternately opening and shutting its wings, the contrast between the brilliant metallic-blue of the upper surface and the dark dull under-side being very great.”\*

\* Journ. Asiat. Soc. Bengl. vol. L. p. 52.

2. *Lampides ælianus*. (Tab. XXI., fig. 18 ♂, and XXII., fig. 19 ♂, *var.*)

*Hesperia ælianus*, Fabricius, Ent. Syst. iii. 1, p. 280, n. 79 (1793).

*Polyommatus ælianus*, Godt. Enc. Méth. ix. p. 654, n. 123 (1823).

*Lycæna ælianus*, Horsf. Cat. Lep. E. I. C. p. 73, n. 9 (1828).

*Lampides ælianus*, Butl. Cat. Fabr. Lep. p. 166, n. 16 (1869); Moore, Proc. Zool. Soc. 1878, p. 833; Lep. Ceyl. vol. i. p. 94, t. 38, f. 3, 3 *ab* (1881); Wood-Mas. & de Nic. J. A. S. B. vol. xlix. p. 229, n. 37 (1880); *ibid.* vol. L. p. 234, n. 30 (1881).

*Papilio alexis*, Stoll (nec Scop.) Suppl. Cram. t. 38, f. 3, 3 C (1790).

*Lycæna alexis*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 25, n. 20 (1857).

Male. Closely allied to *L. elpis*, but differing principally in the following particulars:—the azure-blue coloration above is paler in hue, and the submarginal fasciæ and spots to the posterior wings are much fainter and sometimes almost obsolete; the wings beneath are greyish-brown (varying in depth of hue), and the greyish-white linear fasciæ are arranged generally as in *C. elpis*, but differing in the following respects:—on anterior wings the pair crossing disk near end of cell are more or less regularly continued above cell to near costa, and the outer one terminates near base of first median nervule, the next pair commencing near costa are more continuous, the inner one continued to inner margin, the outer terminating at second median nervule. Posterior wings similarly marked as those of *C. elpis*.

Female. Above resembling the corresponding sex of *C. elpis*, but paler in hue, the apex of the anterior wings rather more broadly fuscous, but with the costal margin not, or very obsoletely infuscated. Markings beneath as in male.

Exp. wings, ♂ and ♀, 30 to 36 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—coll. Moore); Pulni (Robin.—coll. Dist.).—Ceylon (Thwaites—coll. Dist.).—Andaman Islands (Wood-Mas. & de Nic.).—Nicobar Islands; Kamorta, Trinkut, Nankowri (Wood-Mas. & de Nic.).—Burma; Moulmein (Moore).—Tenasserim; Meetan (Limborg—coll. Moore).—Malay Peninsula; Sungei Ujong; Malacca (Biggs—coll. Dist.); Singapore (Kerr—coll. Dist.).—Java (coll. Horsf.); Bantam (Forbes—coll. Dist.).—Borneo; Sandakan (Pryer—coll. Dist.).—Timor Laut (Forbes—Brit. Mus.).

Var. *a. agnata*.

*Cupido agnata*, Druce, Proc. Zool. Soc. 1874, p. 106, t. 16, f. 2-4 (1874).

*Lampides agnata*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 8 (1877).

This proposed species, judging from Mr. Druce's figures, appears to be a variety of *L. ælianus*, differing from the typical form on the underside of the anterior wings, by the arrangement of the greyish linear fasciæ, of which the innermost of the first and second pairs appear to be—beneath the cellular area—more irregularly deflected and waved.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Siam; Nahconchaisee (Druce).

Var. *b.*

Resembling typical form of the species, but differing principally in the darker—more plumbeous—ground colour of the wings beneath and in the male above by the narrower (though very variable in this respect) fuscous margin to the anterior wings.

HAB.—Malay Peninsula; Malacca (Biggs—coll. Dist.).—Java; Bantam (coll. Dist.).—Borneo; Sandakan (Pryer—coll. Dist.).

A strong argument—if one were needed—for the varietal character of this species may be found in a cursory glance at the recorded habitats of the forms *a* and *b* referred to above,

both of which are found in the same locality as that which we understand as the typical form of *L. aliamus*.

Mr. Biggs writes that in Malacca this species is "found in numbers under the shade of tall thick-foliaged forest trees."\*

The larva and pupa, as found in Java, have been figured from the drawings of Dr. Horsfield,† and we are likewise indebted to the Bros. de Alwis for drawings of the same as observed in Ceylon.‡ The last are thus described:—"Larva onisciform; green or violet-brown, with a dark dorsal and lateral black lines. Pupa pale violet-brown."§ According to Dr. Horsfield, the larva "feeds on the *Butea frondosa*,|| and was observed in the month of February in Java."¶

### 3. *Lampides kankena*. (Tab. XX., fig. 18 ♂, and 11 ♀.)

*Lycæna Kankena*, Felder, Verh. Zool. Bot. Ges. xii. p. 481, n. 106 (1862); Reise Nov. Lep. ii. p. 270, n. 331, t. 34, f. 37 (1865).

*Lampides Kankena*, Moore, Proc. Zool. Soc. 1877, p. 588; Wood-Mas. & de Nic. J. A. S. B. vol. L. p. 235, n. 38 (1881).

*Lampides Kankena?* Butl. Trans. Linn. Soc. ser. 2, vol. i. p. 547, n. 10 (1877).

*Cupido Carulea*, Druce, Proc. Zool. Soc. 1873, p. 349, n. 13, t. 32, f. 6.

*Lampides Carulea*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 7 (1877).

Male. Wings above dark, shining, azure-blue; anterior wings with the costal margin narrowly and the outer margin (especially at apex) rather more broadly blackish; posterior wings with the outer margin narrowly blackish, and with two transverse black lines outwardly margined with whitish at anal angle; tail-like appendage black, with the apex white. Wings beneath dark greyish-brown, with a plumbeous tinge, and crossed by the following greyish-white linear fasciæ arranged in pairs:—anterior wings with two crossing end of cell and then dislocated and extending to inner margin, followed by two, likewise dislocated, commencing near costa, and terminating at upper median nervule, continued by a short, single intermediate one reaching the central median nervule, two submarginal and one marginal; posterior wings with three pairs more or less dislocated, two waved submarginal and one marginal; a large black marginal spot containing a few scattered bluish scales and inwardly broadly surrounded with ochraceous situate between second and third median nervules, and at anal angle a black transverse angulated streak, margined with greyish-white and inwardly bordered by a few bluish scales and a small ochraceous spot. Body above with the thorax more or less concolorous with wings, the abdomen greyish-brown, with the lateral segmental incisures greyish-white; body beneath greyish-white; legs fuscous, more or less annulated with greyish, the femora wholly greyish beneath.

Female. Wings above with the blue coloration less resplendent, the anterior wings with the apex and outer margin more broadly blackish; posterior wings with a marginal row of blackish spots bordered with greyish, placed between the nervules, that at anal angle transversely linear and angulated. Wings beneath as in male, the ochraceous margining of the subanal spot larger and more diffused.

Exp. wings, ♂ & ♀, 25 to 32 millim.

HAB.—Nicobar Islands; Kar Nicobar (Felder).—Malay Peninsula; Sungei Ujong (Biggs—coll. Dist.).—Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (Kerr—coll. Dist.).—Borneo (Druce).

\* 'Month. Packet,' vol. ii. p. 191 (1881).

† Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. t. 1, f. 1, 1a.

‡ Moore's Lep. Ceyl. i. t. 38, f. 3b.

§ Ibid. p. 95.

|| The "dhak tree," which in Northern India affords a tannin substance from its inner bark, a yellow dye from its flowers, whilst the lac insects deposit "lurid red tears" on its twigs.

¶ Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 25.

I have here figured two specimens collected by Capt. Pinwill in Malacca, the male of which was recorded as *L. carulea* and the female as *L. kankena?* by Mr. Butler. I have since received a small series of specimens which place their sexual relationship and conspecific character beyond doubt. It is singular that though Felder described the species as from Kar Nicobar, Messrs. Wood-Mason and de Nicéville,—who have obtained large and rich collections from the Nicobar Islands,—in their last enumeration of that Rhopalocerous fauna, prefix to the name of this species the sign that denotes a “recorded species of which we have not as yet received specimens.”\*

#### 4. *Lampides* sp. (Tab. XXI., fig. 24 ♂.)

Of this species I possess only one male specimen, and I refrain at present from either precise identification or description. It is allied to *L. kankena*, especially by the markings beneath, but is a much larger insect, and the colour above is considerably paler in hue. More specimens, and the knowledge of the female sex, are necessary for its proper determination.

HAB.—Malay Peninsula; Malacca (coll. Dist.).

### Genus POLYOMMATUS.

*Polyommatus*, Latreille, Sonnerat's Buffon, xiv. p. 116 (1805); Gen. Crust. et Ins. iv. p. 206 (1807); Scudd. Proc. Am. Ac. Arts & Sci. vol. x. p. 253, n. 888 (1875); Moore, Lep. Ceyl. vol. i. p. 93 (1881).

*Polyommatus* is easily separated from all the preceding genera of this division, as here enumerated, by the character of the first subcostal nervule of the anterior wings, which, emitted a little beyond middle of cell, is continued free to costa, and is not anastomosed with, nor impinges on, the costal nervure; the second subcostal nervule is emitted nearer to base of third than to base of first, the third and fourth bifurcating at about half the length of third. The other characters approximate somewhat closely to *Catochrysops* and *Lampides*.

The almost universal distribution of this genus throughout the Old World is sufficiently shown by the habitats of the only species found in our fauna, and here enumerated.

I have followed Mr. Scudder in his ruling as to the proper use and limit of this old generic name, a position already accepted by Messrs. Moore, Butler, de Nicéville, and other workers at Eastern Rhopalocera.

#### 1. *Polyommatus bæticus*. (Tab. XX., fig. 8 ♂, 1 ♀.)

*Papilio Bæticus*, Linnæus, Syst. Nat. i. 2, p. 789, n. 226 (1767); Esp. Schmett. i. 1, t. 27, f. 3a, b (1778); i. 2, t. 91, f. 3 (1784); Hübn. Eur. Schmett. i. f. 373—375 (1798—1803).

*Polyommatus bæticus*, Godt. Méth. ix. p. 653, n. 122 (1823); Moore, Lep. Ceyl. i. p. 93 (1881).

*Lycana Batica*, Horsf. Cat. Lep. E. I. C. p. 80, n. 14 (1828); Mill. Ann. Soc. Lyon. 1861, p. 229, t. 4, f. 1—6; Trim. Rhop. Afr. Austr. ii. p. 236, n. 138 (1866); Elwes, Proc. Zool. Soc. 1881, p. 887.

*Lycana Bæticus*, Snell. Tijd. Ent. xix. p. 152, n. 45 (1876); Mab. Bull. Soc. Zool. Fr. 1877, p. 215.

*Lampides Bæticus*, Butl. Cat. Fabr. Lep. p. 165, n. 11 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 547, n. 6 (1877).

\* J. A. S. B. vol. li. pt. 11, pp. 17 & 20 (1882).

*Lampides Baticea*, Walk. Ent. vol. v. p. 52, n. 42 (1870); Newm. Brit. Butt. p. 117, f. 39 (1874).

*Cupido baticeus*, Auriv. Öfv. Vet.-Ak. Förh. 1879, no. 7, p. 44; Snell. Tijd. Ent. xx. p. 2 (1877); *ibid.* xxi. p. 23, n. 90 (1878).

*Papilio Colutea*, Fuessly, Schweiz. Ins. p. 31, n. 594, f. 2, 2 (1775).

*Papilio Pisorum*, Fourer, Ent. Paris. ii. p. 242, n. 25 (1785).

Male. Wings above pale violaceous; anterior wings with the costal margin narrowly and the outer margin more broadly pale fuscous; posterior wings with the costal and posterior margins pale fuscous, a large black marginal spot between second and third median nervules, and two contiguous smaller black spots at anal angle. Wings beneath pale brownish-ochraceous, with the following linear brownish fasciæ margined with greyish:—anterior wings with two crossing centre and two near end of cell, two (considerably fractured), crossing wing between end of cell and outer margin, commencing near the fourth subcostal nervule and terminating at submedian nervure, two submarginal (the innermost broadest), and the outer margin narrowly pale fuscous; posterior wings crossed from base to beyond middle with about eight linear fasciæ as on anterior wings (more or less fused and broken), followed by a distinct and somewhat broad greyish fascia, and with two submarginal linear brownish fasciæ; two large marginal spots containing a few scattered greenish scales and inwardly margined with pale reddish ochraceous, separated by the lower median nervule; outer margin narrowly fuscous; fringe of both wings pale brownish, the tips greyish-white. Body above more or less concolorous with wings, beneath with legs greyish-white; legs more or less streaked with brownish.

Female. Wings above pale brownish; anterior wings with a discal bluish patch; posterior wings with two outer greyish submarginal fasciæ, the innermost broadest; black anal angular spots as in male, distinctly margined with greyish; wings beneath as in male.

Exp. wings, ♂ and ♀, 30 to 38 millim.

HAB.—Europe, generally south of the Alps.\*—Madeira (Brit. Mus.).—Teneriffe (Brit. Mus.).—St. Helena (Trimen).—Egypt (Lord—Walk.).—Congo (Mabille).—Southern Africa (Trimen).—Damara Land (Aurivillius).—Delagoa Bay (Monteiro—coll. Dist.).—Madagascar (Trimen).—Mauritius (Trimen).—Arabia (Lord—Walk.).—Candahar (Roberts—Brit. Mus.).—Continental India; Kurrachee (Swinhoe—Brit. Mus.); Pulni (Robinson—coll. Dist.); Sikkim (de Nicéville).—Ceylon (Thwaites—coll. Dist.).—Malay Peninsula; Penang (Pinwill—Brit. Mus.); Sungei Ujong (Biggs—coll. Dist.); Malacca (Biggs—coll. Dist.).—Sumatra (Snellen).—Java (coll. Horsf.); Batavia (Snellen); Bantam (coll. Dist.).—Celebes (Snellen).—Ceram (Brit. Mus.).—Aru (Brit. Mus.).—Duke York Island (Brown—coll. Godm. & Salv.).—Australia; Melbourne (Butler).—Shanghai (Elwes); Hong Kong (Brit. Mus.).—Japan (Elwes).

In Europe the food-plant of the larva of this widely distributed species is the “bladder senna” (*Colutea arborescens*), a hardy plant reported to even grow on the ascent to the crater of Vesuvius. In Mauritius Mr. Trimen found the butterfly “almost confined to gardens, where it kept about the cultivated pea.” †

According to Mr. Elwes this insect, although found in Japan and at Shanghai, is not known in Amurland, ‡ and it seems little affected by local conditions as modifying agencies in colour markings, though M. Mabille writes of the species as found in the Congo district of West Africa:—“Il est un peu plus sombre que les individus d’Europe, en même temps plus bleu, et ses ailes sont bien plus minces.” §

\* This species has occasionally been captured in England, and is not altogether confined to Southern Europe.

† Trans. Ent. Soc. ser. 3, vol. v. p. 337 (1866). This butterfly seems to follow the introduction of agriculture. Dr. Horsfield states that his Javanese specimens were “collected chiefly in the cultivated districts.” It is also dependent on the seasonal method of cultivation, for as Mr. Newman observed in England, “it only occurs in our pea-fields now and then, but its existence must be very precarious, because the egg would, in all probability, perish with the pea-haulm, which is rarely kept through the spring and summer” (Brit. Butt. p. 118).

‡ Proc. Zool. Soc. 1881, p. 887.

§ Bull. Soc. Zool. Fr. 1877, p. 215.

## Genus LYCÆNESTHES.

*Lycænesthes*, Moore, Proc. Zool. Soc. 1865, p. 773; Lepid. Ceyl. vol. i. p. 87 (1881).

Anterior wings broad, costal margin slightly arched at base, oblique to near apex (which is subacute), outer and inner margins nearly straight. Costal nervure extending to about half the length of costal margin, first subcostal nervule emitted beyond middle of cell, second and third somewhat close together a little before end of cell, third and fourth bifurcating at about half the length of third; cell extending to more than half the length of the wing; the three median nervules emitted near end of cell, the bases of the first and second much closer together than the bases of the second and third. Posterior wings subovate, somewhat elongate towards anal angle, the outer margin obliquely convex, with two short delicate ciliary tail-like appendages situate respectively at apices of lower median nervule and submedian nervure. First subcostal nervule emitted at about one-fourth before the end of cell; first and second median nervules emitted close together near end of cell, the third at about middle of cell. Body robust; palpi projecting nearly half their length beyond the head, the apical joint slender, about half the length of the second; legs slender; anterior tibiae very finely spined beneath.

The geographical distribution of this genus cannot be estimated in our present ignorance of even all the described species which belong to it. The African *Lycænidæ* also require to be carefully worked out before we can say that many of these genera are even confined to the Oriental region.

1. *Lycænesthes lycænina*. (Tab. XXI., fig. 3 ♂.)

*Lycænesthes lycænina*, Felder, Verh. Zool. Bot. Ges. 1868, p. 281; Moore, Lepid. Ceyl. i. p. 87, t. 35, f. 8, 8a (1881).

Male. Wings above lavender-blue, the margins narrowly fuscous. Wings beneath greyish-brown, crossed by the following pale greyish linear fasciæ:—anterior wings with two disco-cellular at end of cell, followed by two also terminating at the upper median nervule, two extending from near the base of upper median nervule to submedian nervure, a single one between the first and second median nervules, and two somewhat waved submarginal; posterior wings with about eight arranged in pairs, the basal pair not extending above middle of cell, the two following from near base of lower subcostal nervule to near abdominal margin, the third pair very short and bounded by the costal nervure and the lower subcostal nervule, and the fourth pair situate between the lower subcostal nervule and the middle median nervule, and two much angulated submarginal fasciæ; a small brown spot margined with greyish beneath and at a short distance from base of costal nervure, and a similar spot near base of abdominal margin,\* a black submarginal spot with a few bluish scales and inwardly margined with ochraceous situate between the second and third median nervules and a narrow transverse dark streak at anal angle. Body both above and beneath more or less concolorous with wings.

Female.—Unknown to the writer. Mr. Moore describes it † as “violet-brown; basal area suffused with blue; marginal anal spots more distinct.”

HAB.—Ceylon (Thwaites—coll. Dist.).—Malay Peninsula; Province Wellesley (coll. Dist.).

Although I have somewhat minutely described the arrangement of the greyish linear fasciæ on the under surface of the posterior wings belonging to a male specimen, such

\* These spots have been unfortunately omitted by the artist; the specimen figured—the only one, then, received from the Malay Peninsula—being in very bad condition.

† Lep. Ceyl. vol. i. p. 87.

description must not be taken to imply that these markings are of a constant and invariable character, as in the small series now before me there is slight but unmistakable divergence in that respect.

## Group APHNARIA.

*Aphnaria*, Distant, *antea*, p. 196.

I propose under the above name to group together a very large number of genera, comprising some of the largest species in the family. It is in this group also that the posterior wings attain the greatest amount of caudate elongation. I have used the number of these tail-like appendages as an assistant factor in the artificial key to the genera which here follows, but in so doing have only recognised them when they are distinctly developed.

## SYNOPSIS OF GENERA.

1. Posterior wings with three slender tail-like appendages.
  - A. Anterior wings with three subcostal nervules.
    - a. Tail-like appendages short and slender.
      - b. Costal nervure of posterior wings extending to near apex of wing. - - - - - CATAPECILMA.
    - aa. Tail-like appendages longer and more robust.
      - bb. Costal nervure of posterior wings not reaching apex of wing. - - - - - DRUPADIA.
  - AA. Anterior wings with four subcostal nervules.
    - c. Tail-like appendages moderately long and robust.
      - d. First subcostal nervule of anterior wings emitted at about centre of cell. - - - - - BIDUANDA.\*
    - ce. Tail-like appendages short and slender.
      - dd. First subcostal nervule of anterior wings emitted beyond centre of cell. - - - - - SEMANGA.†
2. Posterior wings with two slender tail-like appendages.
  - B. Anterior wings with five subcostal nervules. - - - - - DACALANA.
  - BB. Anterior wings with four subcostal nervules.
    - e. First subcostal nervule of anterior wings anastomosed with costal nervure. - - - - - JACOONA.‡
    - ee. First subcostal nervule of anterior wings not anastomosed with costal nervure.
      - f. Costal nervure of posterior wings extending to, or near to, apex of wing.
      - g. Costal nervure of anterior wings terminating on costa nearly opposite end of cell.
      - h. Tail-like appendages moderately short and slender.
        - i. Fourth subcostal nervule of anterior wings emitted at about two-thirds the distance between base of third and apex of wing. - - - - - SPINDASIS.
        - ii. Fourth subcostal nervule of anterior wings emitted about midway between base of third and apex of wing. - - - - - TAJURIA.



FIG. 67.—Anterior wing of *Catapecilma elegans*, showing subcostal nervules.



FIG. 68.—Posterior wing of *Drupadia moorei*, showing position of costal nervure.



FIG. 69.—Anterior wing of *Semanga superba*, showing position of subcostal nervules.



FIG. 70.—Anterior wing of *Dacalana vidura*, showing subcostal nervules.

\* Gen. nov. type *Myrina thesmia*, Hew.

† Gen. nov. type *Ilerda! superba*, Druce.

‡ Gen. nov. type *Myrina anasuja*, Feld.

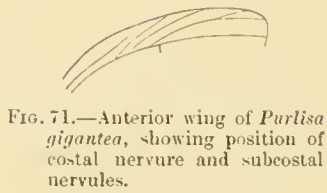


FIG. 71.—Anterior wing of *Purlisa gigantea*, showing position of costal nervure and subcostal nervules.

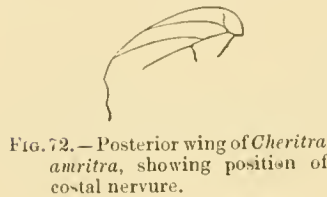


FIG. 72.—Posterior wing of *Cheritra amrita*, showing position of costal nervure.

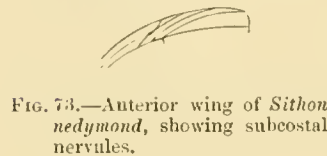


FIG. 73.—Anterior wing of *Sithon nedymond*, showing subcostal nervules.

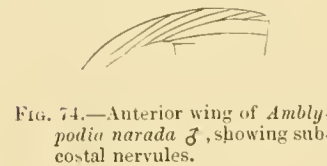


FIG. 74.—Anterior wing of *Amblypodia narada* ♂, showing subcostal nervules.

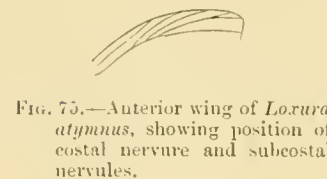


FIG. 75.—Anterior wing of *Loxura atymnus*, showing position of costal nervure and subcostal nervules.

- hh.* Tail-like appendages consisting of an outer long and robust, and an inner short, broad, and lobular. - BINDAIARA.
- gg.* Costal nervure of anterior wings terminating on costa considerably before end of cell.
- j.* A long tail-like appendage at apex of lower median nervure and a short one at apex of submedian nervure. - NEOMYRINA.\*
- jj.* A long tail-like appendage at apex of submedian nervure and a short one at apex of lower median nervure. - PURLISA. †
- ff.* Costal nervure of posterior wings terminating at about two-thirds of costal margin. - CHERITRA.
- BBB. Anterior wings with three subcostal nervules.
  - k.* First subcostal nervure of anterior wings impinging on the costal nervure. - SITHON.
  - kk.* First subcostal nervure of anterior wings not impinging on the costal nervure. - HYPOLYCENA.
- 3. Posterior wings with a single tail-like appendage in male, and with two in female. - IRAOTA.
- 4. Posterior wings with a single tail-like appendage in both sexes.
  - C. First subcostal nervule of anterior wings emitted at, or before, middle of cell.
    - l.* Anterior wings with four subcostal nervules.
      - m.* Costal nervure of anterior wings extending only to about one-third of costal margin. - NARATHURA.
      - mm.* Costal nervure of anterior wings extending to about half of costal margin. - PANCHALA.
    - ll.* Anterior wings with five subcostal nervules in male and four in female. - AMBLYPODIA.
  - CC. First subcostal nervule of anterior wings emitted beyond middle of cell.
    - n.* Apex of costal nervure of anterior wings terminating opposite end of cell. - RAPALA.
    - nn.* Apex of costal nervure of anterior wings terminating a little beyond end of cell. - DEUDORIX.
    - nnn.* Apex of costal nervure of anterior wings terminating before end of cell. - LOXURA.

Genus CATAPÆCILMA.

*Catapæcilma*, Butler, Trans. Linn. Soc. ser. 2, vol. i. p. 547 (1877); Moore, Lep. Ceyl. vol. i. p. 97 (1881).

Anterior wings subtriangular, the costal margin only slightly convex, the apex obtusely rounded, the outer margin moderately convex and scalloped, the inner margin slightly concavely sinuate. Costal nervure short, terminating on costa nearly opposite end of cell; first subcostal nervule emitted near middle of cell, second about midway between base of first and third, the last of which is emitted close to end of cell and continued to apex; middle median nervule emitted about one-fifth before end of cell; lower median nervule a little beyond centre. Posterior wings irregularly subovate, the costal margin convex at base and then nearly straight to apex, which is rounded; posterior margin very slightly scalloped, with

\* Gen. nov. type *Myrina hiemalis*, Godm. & Salv.

† Gen. nov. type *Iolaua (Purlisa) giganteus*, Dist.



three slender tail-like appendages situate respectively at the apices of the second and third median nervules and of the submedian nervure. Costal nervure extending to about apex of wing, the subcostal nervules bifurcating about one-third before the end of cell; first and second median nervules emitted close together near end of cell. Palpi moderately long, much compressed, second joint projecting more than half beyond the head and longly hirsute beneath; apical joint slender, but well formed; antennæ with a gradually formed but well-developed apical club.

Only one species of this genus is at present described, and as it is here enumerated the specific habitats must be taken as representing our present knowledge of the generic area of distribution.

### 1. *Catapæcilma elegans*. (Tab. XXII., fig. 17 ♂.)

*Hypochrysops elegans*, Druce, Proc. Zool. Soc. 1873, p. 350, t. 32, f. 12.

*Catapæcilma elegans*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 1 (1877); Moore, Lep. Ceyl. vol. i. p. 98 (1881).

Male. Wings above dark violet-blue, with the costal and outer margins somewhat narrowly dark fuscous; posterior wings with an inner greyish marginal line from beneath the subcostal nervules and with three transverse greyish submarginal streaks near anal angle divided by the median nervules, tail-like appendages fuscous, with their apices greyish-white; fringe of both wings greyish. Wings beneath greyish-brown. Anterior wings with three rufous spots, margined with black and silvery crossing cell, a series of silvery spots in the subcostal area, two beyond cell divided by the lower discoidal nervule, two or three beneath cell (both of these followed by ochraceous and black), an outer and irregular discal series of five spots crossing wing and a submarginal series in which the silvery hue is somewhat less intense; between the discal and submarginal series of spots are some dark fuscous markings. Posterior wings with the following rufous spots, margined with black and silvery:—two beneath costal nervure, one (round) about centre of cell, and one (transverse) at end of cell, two beneath cell and situate between the submedian nervure and third median nervule, and one (transverse) about centre of abdominal margin; on about basal third of costal margin are some rufous, black, and silvery markings, two discal series of silvery spots margined with black cross wing, between and beyond which are some black spots on a rufous ground colour, a submarginal series of pale silvery spots placed between the nervules, that between the second and third median nervules replaced by a black spot margined with rufous, and the silvery spots at anal angle margined with black; tail-like appendages pale fuscous with their apices greyish-white; fringe of both wings silvery grey. Body above and beneath more or less concolorous with wings.

Female.—Wings above pale violet-blue, with the costal and outer margins broadly dark fuscous, the posterior wings with three pale transverse spots near anal angle divided by the second and third median nervules and the inner margin also narrowly silvery at this area. Wings beneath with the ground colour much paler than in male, but with the markings similar.

Exp. wings, ♂ and ♀, 27 to 35 millim.

HAB.—Ceylon (Thwaites—coll. Dist.).—Malay Peninsula; Perak (coll. Godfery); Sungei Ujong (Durnford—coll. Dist.).—Borneo (Lowe—coll. Godm. & Salv.).

Since this beautiful insect was described from a Bornean specimen, it has been found to inhabit both the Malay Peninsula and Ceylon, and has doubtless an even wider geographical distribution. Chromo-lithography has proved unequal to producing the silvery metallic

spots on the under surface of the wings, and which in the figure here given appear greenish.\*

### Genus DRUPADIA.

*Drupadia*, Moore, MS.

This genus is allied to *Catapæcilma* in having only three subcostal nervules to the anterior wings and in possessing three tail-like appendages to the posterior wings. The differential points exist most strongly in the posterior wings, which are convex at base and then strongly oblique to apex, which is subacute; the posterior margin is oblique to apex of middle median nervule, when it is more produced and contains a tail-like appendage at the apices of the second and third median nervules and of the submedian nervure; the abdominal margin is very strongly cleft near anal angle; the costal nervure does not extend to about apex as in *Catapæcilma*, but terminates on costal margin at about two-thirds of its length; the subcostal nervules bifurcate a little beyond middle of cell, and the first and second median nervules have an apparently common origin a little before end of cell; the internal nervure is straight and terminates just above the excavation of the abdominal margin. The palpi are robust and porrect, the second joint clothed with coarse adpressed hairs projecting fully two-thirds of its length beyond the eyes; the third joint is slender compared with the second joint, but robust compared with the corresponding joint of many other somewhat allied genera. Legs moderately robust.

*Drupadia* superficially resembles the following genus (*Biduanda*), and as arranged by Mr. Moore it included the species which here stands as the type of *Biduanda*. The resemblance, however, is only superficial, as one genus possesses three subcostal nervules to the anterior wings, and the other genus is provided with four.

The extent of its geographical distribution cannot at present be estimated till the whole of the *Lycenidæ* are properly monographed.†

#### 1. *Drupadia moorei*.‡ (Tab. XX., fig. 21 ♂, 20 and 30 ♀.)

*Sithon Moorei*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. x. p. 246 (1882).

Male. Anterior wings above very dark and glossy fuliginous-brown, with an irregular reddish spot or suffusion situate at end of cell and bases of the median nervules: posterior wings bright and somewhat

\* The structure and nature of these silvery spots have lately been investigated by Mr. Geo. Dimmoek ('Psyche,' vol. iv. pp. 64 and 66), and he has not only shown that "Leydig was the first, in 1855, to call attention to the presence of air between or beneath their chitin layers as a cause for certain silvery spots and scales on insects," but has treated the question more exhaustively, and has argued (taking the silvery spots of *Argynnis idalia* as an example) that these spots not only contain air, but are "simply milk-white by transmitted light." "The difference is that there must be in the silvery scales a polished surface towards the observer. Ground glass does not appear silvery, but what is the surface of the smoothest polished plate of glass but finely ground glass? Ground glass differs from polished glass only in degree; in ground glass the scratches are so coarse and so abundant as to turn most of the light-waves into the glass again, where they are lost. In polished glass the scratches are still present, but have become so small that even the waves of light are large in proportion to them, and so the light-waves reflect as if from a theoretically flat surface. But something more than a polished glass is needed to reflect much light, for most of the light passes through the glass; something non-transparent must be behind the glass. In the common mirror it is a mercury amalgam; in the butterfly's silvery scale it is a layer of cavities filled with air. This layer of cavities is not transparent for the same reason that ground glass is not. If we treat the scale with chloroform it has an analogous effect to that of treating the back of a common mirror with nitric acid, thus dissolving off the amalgam. In both cases a non-transparent body is converted into a transparent one, and a mirror, which, whatever be the materials of which it is made, if approximately perfect, has a silvery appearance from the amount of reflected light, is reduced to a slightly reflecting surface. But let the scale dry again from its bath, as Fischer apparently did not do, and the mirror will again appear. Both silvery and milk-white colorations are then only optical effects produced by reflected light."

† It is greatly to be desiderated that some competent entomologist would give a monographic catalogue of the *Lycenidæ*, in the manner of the late Dr. Stål's 'Enumeratio Hemipterorum,' in which a key to the whole genera would be given, and in which some principle of variation in nature would be admitted. Our British Museum has a magnificent collection, and its staff of endowed officials may ultimately produce this necessary work, for which other students, as a rule, possess neither the time nor material.

‡ Named after Mr. Frederick Moore, who in conjunction with Dr. Horsfield, published the 'Cat. Lep. Mus. E. I. C.,' and has since written a 'Lepidoptera of Ceylon.'

§ This figure was taken from a much mutilated specimen, with the tail-like appendages to the posterior wings almost destroyed.

pale bluish, the posterior margin black, inwardly bordered with white near anal angle, where there are two transverse black marginal spots, the fringe white; tail-like appendages blackish with marginal white fringe; costal area pale hyaline, darker near base, upper portion of cell and basal area between subcostal nervules tale-like, and pale transparent stramineous, above, beneath, and beyond which the colour is fuscous. The anterior wings beneath reddish ochraceous, a broad basal and a transverse central fuscous streak in cell, a pale fuscous line at end of cell, and two transverse, narrow, waved fuscous fasciæ between end of cell and outer margin. Posterior wings greyish-white, the costal margin more or less suffused with reddish ochraceous, and with ten large fuscous discal spots, the upper six of which are subquadrate but irregular in size, and the posterior four are more irregular in shape, and have their centres more or less greyish; a submarginal and marginal fuscous line, the first of which is broken and irregular, and between which and the margin is a narrow fuscous streak, leading to a long, pale bluish fuscous spot; beneath the submarginal line near abdominal margin are two narrow ochraceous fasciæ, which amalgamate inwardly, and between which the colour is pale metallic bluish. Body above fuliginous-brown, beneath greyish-white; legs greyish-white, annulated and streaked with fuscous.

Female. Wings above much paler than in male, and the posterior wings pale fuliginous-brown, excepting near anal angle, where there is an obscure bluish patch with a few obscure fuscous marginal spots. Wings beneath as in male, but with anterior wings paler in hue.

Expanse of wings, 35 to 38 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist. & Sauer); Perak (Townsend—coll. Godm. and Salv.); Sungei Ujong (Durnford); Malacca (Biggs); Singapore (Kerr—coll. Dist.).—Sumatra (Wallace—coll. Dist. & Moore).—Daat Island (coll. Dist.).

This species varies very much in size, and is probably somewhat widely distributed. It is allied to the *Myrina ravindra*, Horsf., a Javan species which belongs to, and is the type of, this genus. We thus find *D. moorei* inhabiting Borneo, Sumatra, and the Malay Peninsula, and differing from a closely allied Javan species, as is so frequently the case in all branches of Malayan Zoology, and has been so well and ably pointed out by Mr. Wallace.

#### Genus BIDUANDA, gen. nov.

*Biduanda*, Distant, *antea*, p. 233.

Anterior wings globosely subtriangular, the costal margin arched, the outer margin convex, the inner margin nearly straight. Costal nervure terminating on costa before the apex of cell; first subcostal nervule emitted about the middle of cell, second about midway between first and third, the last of which arises a little before end of cell, third and fourth bifurcating at a short distance from apex of wing; disco-cellular nervules somewhat perpendicular; first median nervule emitted at end of cell, second nearer to first than third, which is emitted beyond middle of cell. Posterior wings subovate; costal margin arched at base, and then straight and strongly oblique to apex, which is obtuse; posterior margin as in *Drupadia*, the abdominal margin angulated but not so suddenly cleft as in that genus. Costal nervure reaching apex of wing; other neuration much as in *Drupadia*.

The species included in this genus were given me by Mr. Moore as forming part of his genus *Drupadia*, the description of which is promised to be published in a forthcoming part of the 'Journal of the Asiatic Society of Bengal.' As they, however, possess four subcostal nervules to the anterior wings, whilst the species of *Drupadia* are provided only with three, it became necessary to form a new genus for their reception. Mr. Moore takes the *Myrina ravindra*, Horsf., as the type of *Drupadia*, and the type of *Biduanda* must be found in the *Myrina thesmia*, Hew.

1. *Biduanda thesmia*.

*Myrina Thesmia*, Hewitson, Ill. Diurn. Lep. p. 32, n. 16, t. 14, f. 25—27 (1863).



FIG. 76.—*Biduanda thesmia*, ♂.



FIG. 77.—*Biduanda thesmia*, ♀.

I have not as yet received this species from the Malay Peninsula, so have followed my usual course of copying both the original figures\* and diagnosis of the describer.

“Upperside. *Male*.—Purple-brown. Anterior wing with the inner margin curved, projecting. Posterior wing with three tails; the outer margin and base of the tails black; a submarginal line between the tails, the fringe and the tails white.”

“Underside. Anterior wing rufous orange, with two spots in and below the cell, a spot at the end of the cell, three transverse lines (the first, which is near the second, indistinct), the outer margin, and fringe, all brown. Posterior wing white (the apex rufous), with eight brown spots, followed by several zigzag black lines: the caudal spot, the lobe, and the space between them crowned with silvery blue: a spot above the lobe also powdered with blue: the outer margin black: the fringe white.”

“*Female* does not differ from the male, except that it is rufous-brown above, and has the anal angle of the posterior wing grey, marked with the caudal spots.”

Exp. wings, “ $1\frac{7}{30}$  inch.”

HAB.—Malay Peninsula; Singapore (coll. Hewits.).—Sumatra (coll. Hewits.).—Daat Island (coll. Dist.).

Mr. Hewitson describes his species as closely allied to *M. ravindra*, Horsf., a species which belongs to the previous genus *Drupadia*, and so is structurally differentiated apart from colour divergencies. Mr. Hewitson also writes, “A male in the collection of Mr. Wallace has a rufous spot at the centre of the anterior wing, as represented in the accompanying figure” (fig. 76).

2. *Biduanda lapithis*. (Tab. XX., fig. 29 ♀.)

*Myrina Lapithis*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. vol. i. p. 48, n. 79 (1857); Hewits. Ill. Diurn.

Lep. p. 36, n. 32, t. 15, f. 35—38 (1863); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 5 (1877).

*Sithon Lapithis*, Druce, Proc. Zool. Soc. 1873, p. 351, n. 7.

*Female*. Wings above rufous-brown: posterior wings with a large greyish-white patch at area of anal angle containing three indistinct bluish spots separated by the second and third median nervules; abdominal area greyish-white, with the margin brown; tail-like appendages blackish, with their margins greyish-white. Anterior wings beneath reddish-ochraceous, with a transverse white fascia crossing end of cell and widened towards inner margin; this fascia is broadly margined with fuscous on each side and is outwardly followed by a waved fuscous line crossing wing, which commencing at about middle of third subcostal nervule, is widely fractured at the upper median nervule, and terminates on inner margin. Posterior wings creamy-white, with the apex ochraceous, and with the following blackish spots:—two near base, three crossing wing before middle, one near end of cell, and a curved outer series commencing beneath the first subcostal nervule and terminating in a long and much angulated spot above the anal angle; extreme posterior margin black, a black submarginal line between the discoidal and first median nervules, three submarginal

\* These figures are *fac-simile* of those of Hewitson, with all errors of neurulation and peculiar arrangement of the tail-like appendages to posterior wings of male.

black spots with scattered bluish scales and inwardly margined with ochraceous, separated by the median nervules, and a pale bluish streak inwardly margined with black and outwardly with ochraceous at anal angle. Body above and beneath more or less concolorous with wings.

Male. This sex is not known to the writer, but has been figured by Mr. Hewitson, and described as "Anterior wing dark brown. Posterior wing brilliant blue."\* Wings beneath apparently as in female.

Exp. wings, ♀, 28 millim.

HAB.—Burma; Moulmein (Horsf. & Moore).—Malay Peninsula; Malacca (Pinwill—Brit. Mus.); Singapore (Wallace—coll. Dist.).—Borneo (Druce).

Mr. Hewitson, who had the opportunity of examining several specimens, states that "on the underside this species varies considerably in the form of the line which crosses the anterior wing beyond the middle, as well as in the size of the black spots of the posterior wing." It appears to be a moderately scarce species, or at all events is uncommon in average collections made in the Malay Peninsula.

### Genus SEMANGA, gen. nov.

*Semanga*, Distant, *antea*, p. 233.

Anterior wings somewhat short and broad, costal and outer margins slightly convex, inner margin very slightly concave. Costal nervure terminating on costa a little before end of cell, where it is somewhat recurved; first subcostal nervule emitted at about one-third before end of cell, second about midway between first and third, third at end of cell, third and fourth bifurcating at about two-thirds the length of third; disco-cellular nervules somewhat oblique; first median nervule emitted at about end of cell, the second emitted about two-thirds nearer the base of first than base of third. Posterior wings subovate, the costal margin rounded at base and then straight and oblique to apex, which is obtuse; posterior margin rounded, very slightly waved or scalloped, with three slender tail-like appendages situate at the apices of the median nervules; abdominal margin concavely excavated a little before anal angle. Costal nervure extending to about apex; costal nervules bifurcating a little before end of cell, and opposite to the apparently common origin of the first and second median nervules; submedian nervure slightly curved outwardly, internal nervure strongly curved inwardly. Palpi robust and porrect, the second joint clothed with coarse and closely compressed hairs and extending for two-thirds its length before eyes; apical joint much more slender than second, but moderately robust. Body robust.

*Semanga* is founded on a species already received from both Borneo and the Malay Peninsula, and its colour affinities are with *Catapacilma*, especially by the metallic markings of the under surface of the posterior wings; an additional subcostal nervule to the anterior wings, however, sufficiently separates it from that genus.

#### 1. *Semanga superba*. (Tab. XXI., fig. 13 ♀.)

*Herda? superba*, Druce, Proc. Zool. Soc. 1873, p. 351, n. 1, t. 32, f. 11.

Female. Anterior wings above dark violaceous, with the costal and outer margins (broadest at apex) dark fuscous; posterior wings with the costal, posterior and abdominal margins fuscous, the posterior margin darkest, and containing some irregularly sized and arranged ochraceous submarginal spots, one between the lower submedian nervule and submedian nervure, and one at lobular anal angle, each

\* Mr. Hewitson also appends to this description. "with one tail," which is clearly erroneous, and probably referred to a mutilated specimen: he has also figured the female much in the same way, and probably from the same cause. My own figure is more or less imperfect for a similar reason.

containing a dark fuscous centre; these spots are followed outwardly by a narrow whitish line, and the apices of the tail-like appendages are also whitish. Wings beneath pale brownish. Anterior wings crossed by a narrow pale castaneous fascia, outwardly bordered with greyish, commencing at lower subcostal nervule and terminating at submedian nervure, and there are faint indications of a greyish submarginal fascia, which is only clearly visible at posterior angle. Posterior wings with the apical half reddish-ochraceous, containing firstly an irregular transverse series of metallic bluish spots, followed by a more or less obscure and very irregular series of black spots, the outer margin broadly blackish, powdered with metallic bluish scales, and with a pale submarginal whitish line. A distinct black spot at lobular anal angle, inwardly margined with bluish. Body above more or less concolorous with wings, beneath greyish; legs greyish, annulated with dark brownish.

Exp. wings, ♀, 28 millim.

HAB.—Malay Peninsula; Malacca (Biggs—coll. Dist.).—Borneo (Lowe—coll. Godm. & Salv.).

I have not seen the male of this species, which will probably prove to be similar to the female, but without the broad blackish margins to the upper surface of the wings. I have only received two specimens from the Malay Peninsula, both collected by the Rev. L. Biggs at Malacca, and for one of which I am indebted to my helpful friend Mr. P. H. Gosse.

### Genus DACALANA.

*Dacalana*, Moore, MS. ??\*

Anterior wings broadly subtriangular, the costal margin very strongly arched at base and slightly convex to apex, which is rounded, outer margin moderately convex; inner margin strongly sinuate, convexly lobular near middle. Costal nervure terminating on costa nearly opposite end of cell; first subcostal nervule short and emitted at about one-third before end of cell; second emitted about midway between first and third, the third arising near end of cell; third and fourth bifurcating at about two-thirds the length of third; fourth and fifth bifurcating near apex at about two-thirds the length of fourth; disco-cellular nervules erect, almost perpendicular; first median nervule arising at end of cell and about half the distance from second as second is from third, which is emitted about two-thirds from base of cell. Posterior wings elongately subovate; costal margin transversely convex for about half its length, and then obliquely deflected to apex, which is obtuse; posterior margin rounded, with two slender tail-like appendages situate respectively at the apices of the third median nervule and submedian nervure. Costal nervure about reaching apex of wing; first subcostal nervule emitted about one-third before the end of cell; first and second median nervules with an apparently common origin at about end of cell; submedian nervure almost straight; internal nervure strongly curved inwardly. Palpi robust, second joint projecting about one-third before the eyes, apical joint slender; body robust; posterior legs long.

Male possessing a sexual tuft of hairs on upper surface of anterior wing beneath cell, and a similar tuft on under surface near inner margin, concealed by the costal margin of the posterior wings.

At present I am only cognisant of the following species as belonging to *Dacalana*, and consequently can only refer to its geographical distribution.

\* Mr. Moore informed me that the species I here include was typical of his genus *Dacalana*, the description of which is not, but would be, published in the Journ. Asiat. Soc. Bengal. He also kindly showed me his MS. description, in which it was stated "venation similar to *Iolaus*." Now the type of *Iolaus* has been shown by Mr. Scudder to be the African species *I. helius*, Fabr., which has four subcostal nervules, whilst the species given me as typical of *Dacalana* possesses five subcostal nervules. Consequently, though I use Mr. Moore's name, as he requested, I cannot accept his diagnosis. The type of *Dacalana* as used and described by myself is the *Amblypodia vidura*, Horsf.

1. *Dacalana vidura*. (Tab. XXI., fig. 27 ♂.)

*Amblypodia vidura*, Horsfield, Cat. Lep. E. I. C. p. 113, n. 45; Th. V. l. c. t. 1, f. 6, 6a (1829).

*Iolais vidura*, Hewits. Ill. Diurn. Lep. p. 43, n. 10 (1865); Druce, Proc. Zool. Soc. 1873, p. 351, n. 1.

Wings above bright, dark cerulean-blue; anterior wings with the costal and outer margins (very broad at apex) blackish; posterior wings with a narrow black posterior marginal line; the tail-like appendages blackish, with their apices greyish-white. Wings beneath pale brownish, both wings crossed about middle by a narrow white fascia, commencing on costa at about end of cell on anterior wings and terminating near anal angle of posterior wings, where it is waved and angulated; beyond this fascia is a somewhat waved dark brownish submarginal line, which on posterior wings is amalgamated with the white fascia at anal angle; a black marginal spot, which is inwardly very broadly margined with ochraceous situate between the second and third median nervules and another black spot surrounded with greyish-white at anal angle; a posterior marginal black line inwardly bordered with greyish-white, and between the third median nervule and the submedian nervure are some scattered whitish scales almost forming a large and distinct conical marginal spot. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 30 to 40 millim.

HAB.—Continental India; Silhet (coll. Hewits.).—Malay Peninsula; Penang (coll. Dist.); Malacca (coll. Dist.); Singapore (coll. Hewits.).—Sumatra (coll. Hewits.).—Java (coll. Horsf.); Bantam (coll. Dist.).—Borneo (Druce); Sarawak (coll. Hewits.).

The female sex is unknown to the writer, and the species appears to be comparatively rare, as remarked by Horsfield.\* It is also subject to slight local variation. Mr. Hewitson states,† “Examples of this species from Silhet have the anal angle of the posterior wing longer than those brought by Mr. Wallace from Sumatra”; and I notice in the specimens now before me that those from the Malay Peninsula have the white fascia on the under surface of the wings a little narrower than in my Javan examples. It is likewise very variable in size, the smallest specimens examined being from Malacca and the largest from Java, but this smallness is not peculiar to Malaccan specimens.

## Genus JACOONA, gen. nov.

*Jacoona*, Distant (*antea*, p. 233).

Anterior wings moderately long and subtriangular; costal margin strongly arched at base and then very slightly convex to apex, which is obtuse; outer margin convex, inner margin slightly sinuate. Costal nervure short, terminating on costa before the end of cell; first subcostal nervule emitted about middle of cell and anastomosed with costal nervure, second nearer to third than first, third arising from end of cell, third and fourth bifurcating a little beyond middle of third; lower disco-cellular nervule somewhat concavely oblique; first median nervule at end of cell, second about half the distance from first as from third. Posterior wings elongate and irregularly subovate; costal margin with its basal third convex and then deflected and oblique to apex, which is rounded; posterior margin oblique and rounded to median nervules, where it is more or less waved and is provided with two tail-like appendages, *viz.*, a short one at apex of third median nervule and a very long one at apex of submedian nervure; abdominal margin convex. Costal nervure about reaching apex of wing; subcostal nervules bifurcating near end of cell; first and second median nervules emitted close together near end of cell, third at about two-thirds from base of cell. Body and legs moderately robust. Palpi erect; second joint raised above the level of the eyes, third joint very small and slender.

\* Cat. Lep. Mus. E. I. C. p. 114.

† Ill. Diurn. Lep. p. 43.

This is probably a somewhat restricted genus, and the following species is alone known to the writer as at present belonging to it. The anastomotic condition of the costal nervure and first subcostal nervule of the anterior wings at once separates it from the allied genera.

Mr. Moore informed me that the typical species of this genus (*Myrina anasuja*, Felder) should be placed in his genus *Cheritra*, but he had probably been unable to examine a specimen.

1. *Jacoona anasuja*. (Tab. XXI., fig. 15 ♂.)

*Myrina Anusuja*, Felder, Reise Nov. Lep. ii. p. 237, n. 266, t. 30, f. 3, 4 (1865).

Male. Wings above bright violaceous-blue. Anterior wings with a broad fascia crossing apical half of cell and terminating a little above posterior angle, the costal margin beyond this fascia, the apex and outer margins all blackish. Posterior wings with the costal and posterior margins (the last as far as between the first and second median nervules) broadly blackish, after which to anal angle the posterior margin is whitish, containing a transverse black spot on each side of the lower median nervule; a black outer marginal line, the tail-like appendages whitish, more or less blackish at base. Anterior wings beneath pale brownish-ochraceous, more or less pale bluish-green at base and towards posterior angle. Posterior wings pale bluish-green, the costal and outer margins (the last as far as median nervules) pale brownish-ochraceous; the white anal angular patch above larger beneath, inwardly margined with a much-waved black line, and containing an additional black spot at extreme anal angle; the tail-like appendages beneath with a central blackish line. Body and legs more or less concolorous with wings.

Exp. wings, ♂ 40 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca, interior (Com. de Castelnau—coll. Feld.).

Of this beautiful and scarce species the writer, like Felder is only acquainted with the male sex, and the female still remains to be discovered.

Genus SPINDASIS.

*Spindasis*, Wallengren, Lep. Rhop. Caffr. p. 45 (1857).

*Aphnaeus* (part), Hewit. Ill. Diurn. Lep. p. 60 (1865).

*Aphnaeus*, Moore (nee. Hübn.), Lep. Ceyl. i. p. 105 (1881).

Anterior wings subtriangular; costal margin slightly arched, outer margin moderately convex, inner margin slightly sinuate. Costal nervure terminating nearly opposite end of cell; first subcostal nervule arising near middle of cell, second about midway between first and third, third and fourth bifurcating at about two-thirds from base of third; disco-cellulars erect; first median nervule emitted at end of cell, second at about twice the distance from third as from first, the third arising a little before middle of cell. Posterior wings irregularly and elongately subovate; costal margin arched at base and then obliquely straight to apex, which is rounded; posterior margin convexly oblique, with two long slender tail-like appendages, situate respectively at apices of the third median nervule and of the submedian nervure; abdominal margin straight, but deeply and concavely excavated near anal angle. Costal nervure about reaching apex of wing; subcostal nervules arising a little before end of cell; first and second median nervules with an apparently common origin just before the end of cell, third median nervule emitted at about two-thirds from base of cell; internal nervure curved inwardly.\* Body moderately robust; palpi porrect, second joint not raised above the level of the eyes.

\* For the purpose of examining the neuration, it is not necessary to denude the wings of the scales, spirits of wine and a camel's-hair brush being quite efficacious, and, if the brush is used lightly, causing no injury to the most delicate *Lycanida*. Benzoline can also be used, but its disagreeable smell renders it less useful than the spirits of wine.



The species of this genus have hitherto been placed in the genus *Aphnæus*, the type of which is the African *A. orcas*, Dru., which has five subcostal nervules to the anterior wings,\* and consequently is quite distinct from *Spindasis*, which has but four. The late Mr. Hewitson pointed out the difference in the neurulation,† and though Mr. Moore, in his 'Lepidoptera of Ceylon,' describes the genus *Aphnæus* on the characters of Ceylon species, and correctly gives the type of the genus as *A. orcas*, he must have been unable to examine a specimen of that species.

There has been, however, no necessity to make a new generic name, as Wallengren proposed his *Spindasis* for the species hitherto known as *Aphnæus natalensis*, D. & H., and under that generic name the Eastern species will find their natural classification.

This is an Ethiopian as well as an Oriental genus, it being particularly well represented in Africa. Only one species from the Malay Peninsula is at present known to the writer. ‡

### 1. *Spindasis syama*. (Tab. XXIII., figs. 8 & 9 ♀.)

*Amblypodia Syama*, Horsfield, Cat. Lep. E. I. C. p. 107, n. 39 (1829).

*Amblypodia Syma*, Westw. Gen. Diurn. Lep. p. 478, n. 20 (1852).

*Aphnæus Syama*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. i. p. 38, n. 50 (1857); Hewits. Ill. Diurn. Lep. p. 61, t. 25, f. 7 (1865).

Male. Wings above fuliginous-brown, shaded with bright violaceous, this shading being principally on the inner basal area of the anterior wings, and on the inner basal half of the posterior wings; anal angle of posterior wings reddish-ochraceous, with two black marginal spots marked with some silvery scales, the first and smallest situate above the submedian nervure; tail-like appendages blackish, with their base ochraceous and their apices greyish-white. Wings beneath very pale ochraceous. Anterior wings with five blackish fasciæ with silvery centres, the first crossing cell a little beyond middle and extending to costal margin, the second commencing on costa at about end of cell and directed outwardly to near posterior angle, the third short, straight and compressed on each side near middle, extending from costa to a little beneath lower discoidal nervule, the fourth directed inwardly and extending from costa to a little beneath upper median nervule (*the third and fourth in some varieties meeting as in fig. 8*), the fifth submarginal and almost, or sometimes quite, meeting apex of second near posterior angle; a longitudinal black streak with a few silvery scales extending nearly along the upper basal half of cell, a broad fuscous streak beneath basal half of cell, a narrow outer submarginal blackish fascia and extreme margin of the same colour. Posterior wings with four blackish fasciæ with silvery centres; the first and basal more or less fractured, the second crossing disk of wing extending beneath the third median nervule (where it is always more or less indistinct), and deflected upwards to abdominal margin, third shortest extending from costa to beneath upper median nervule, the fourth and outer fascia commencing beneath apex, almost lost in the anal-angular ochraceous spot and deflected upwards to abdominal margin; some blackish basal streaks and spots, a narrow posterior submarginal blackish fascia, and the extreme margin of the same colour. Fringe of both wings greyish. Black anal-angular spots as above. Body above more or less concolorous with

\* This is a very rare species, and I am much indebted to both Prof. Westwood of Oxford, and Mr. A. G. Butler of the British Museum, for kindly examining the neurulation of the same for me. Mr. Butler also informs me that Drury's figure of the species is a bad one.

† Ill. Diurn. Lep. p. 60 (1865). He describes *A. orcas* as having four, and the *Syama* group as having three "branches from the subcostal nervure"; but as pointed out (*antea*, p. 197) Mr. Hewitson estimated the number differently to the method pursued here.

‡ Mr. Butler has included in the "List of Butterflies collected by Capt. Pinwill in Malacca" (Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 1), *Aphnæus lohita*, Horsf.; but although I have received a long series of *A. syama* from the various districts of the Peninsula, I have never met—as yet—with an example of *A. lohita*. It is easily recognised from *A. syama*, as pointed out by Horsfield, by the fasciæ on the under surface of the wings being "wholly without any black marginal thread."

wings; body beneath and legs pale ochraceous, lateral margins of the abdomen striped with blackish; legs more or less obscurely marked with the same colour.

Female. Resembling the male, but uniformly fuliginous-brown above, without the violaceous reflections.

Exp. wings, ♂ & ♀, 28 to 32 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Biggs—coll. Dist.).—Java (coll. Horsf.).

### Genus TAJURIA.

*Tajuria*, Moore, Lep. Ceyl. vol. i. p. 108 (1881).

*Remelana*, Moore MS.\*

Anterior wings subtriangular; the costal margin moderately convex, the apex subacute, the outer margin moderately convex, the inner margin slightly sinuate. Costal nervure terminating on costa nearly opposite end of cell; first subcostal nervule emitted near middle of cell, second about midway between first and third, third a little before end of cell, third and fourth bifurcating at about or a little beyond half the length of the third; disco-cellular nervules suberect; first median nervule emitted at end of cell, second nearer to first than to third, third emitted at about two-thirds from base. Posterior wings subovate; costal margin obliquely convex to apex, which is rounded; posterior margin obliquely rounded, prolonged in a more or less distinct angle at apex of second median nervule, and with two slender tail-like appendages situate respectively at the apices of the third median nervule and of the submedian nervure. Costal nervure extending to apex of wing; subcostal nervules bifurcating at about one-third before end of cell; first and second median nervules with an apparently common origin a little before end of cell, third a little beyond middle of cell; submedian nervure slightly curved outwardly; internal nervure strongly curved inwardly. Body robust. Palpi porrect, the apex of the second joint not reaching the upper margin of the eyes.

This genus, proposed by Mr. Moore, is evidently—from the description—closely allied to *Pratapa* of the same author, a genus which I have had no opportunity to examine. The only structural differential characters given are in respect to the posterior wing, which has the “cell broader, the subcostal and median branches emitted further from the base.”

#### 1. *Tajuria longinus*. (Tab. XXIII., fig. 20 ♀.) †

*Hesperia Longinus*, Fabricius, Ent. Syst. Suppl. p. 430 (1798).

*Polyommatus Longinus*, Godt. Enc. Méth. ix. p. 634, n. 63 (1823); Luc. Lep. Ex. t. 44, f. 3 (1835).

*Bithys Longinus*, Hübn. Zutr. Ex. Schmett. f. 933, 934 (1837).

*Amblypodia Longinus*, Horsf. Cat. Lep. E. I. C. p. 110, t. 1, f. 7 (1829); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 45, n. 70 (1857).

*Iolaus Cippus*, race *Longinus*, Butl. Cat. Fabr. Lep. p. 186, n. 2 (1869).

*Iolaus Longinus*, Hewits. Ill. Diurn. Lep. p. 45, n. 18 (1869); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 1 (1877).

*Amblypodia Pseudolonginus*, Doub. List Lep. Brit. Mus. ii. p. 23 (1847); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 45, n. 71 (1857).

*Iolaus Pseudolonginus*, Butl. Proc. Zool. Soc. 1867, p. 35.

*Tajuria Longinus*, Moore, Lep. Ceyl. vol. i. p. 109, t. 42, f. 2. 2a, 2b (1881).

Mr. Moore informs me that in this proposed genus the “venation is similar to *Tajuria*.”

† This figure is taken from a specimen in the British Museum, which was collected by Capt. Pinwill in Malacca.

Male. Wings above dark shining cærulean-blue; anterior wings with the costal margin and the apical half of wing—inwardly angulated at median nervure and narrowed into a marginal fascia beneath lower median nervule—blackish; posterior wings with the costal margin and apex broadly and the posterior margin narrowly blackish, tail-like appendages blackish, with their apices white; abdominal margin greyish-brown. Wings beneath dark greyish: anterior wings with an outer discal series of linear fuscous or blackish spots placed between the nervules and a submarginal series of rather larger but much paler spots—these are sometimes almost obsolete; the outer margin also darker; posterior wings with two similar series of spots, the inner and darker series longer, more continuous and waved towards anal angle, where it is duplex, a third marginal series of spots, two black marginal spots inwardly broadly margined with ochraceous, situate respectively between the second and third median nervules, and at anal angle; some scattered bluish scales between lower median nervule and submedian nervure; the extreme outer margin blackish; fringe of both wings brownish-grey. Body and legs more or less concolorous with wings.

Female. Wings above very pale violaceous-blue; anterior wings with the costal and outer margins (broadest at apex) dark fuscous; posterior wings with the basal third clothed with fine long greyish hairs, and with the costal margin broadly dark fuscous, a submarginal row of fuscous spots (*sometimes obsolete towards abdominal margin, as in the specimen figured*), and a marginal row of larger fuscous spots (*sometimes fused and amalgamated towards apex into a marginal fascia*), apex of abdominal margin fuscous, the spot at anal angle containing some scattered bluish scales, and more or less distinctly inwardly margined with ochraceous. Wings beneath as in male.

Exp. wings, ♂ and ♀, 35 to 38 millim.

HAB.—Continental India; “N. India,” *sic.* (Horsf. & Moore).—Ceylon (Thwaites—coll. Dist.).—Burma; Moulmein (Brit. Mus.).—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Java (coll. Horsf.).

The larva and pupa of this species, as observed in Java, have been figured by Horsfield,\* who thus describes the first:—“The larva is considerably distended anteriorly, excavated at the sides, contracted behind and transversely swelled at the segments.” It feeds “on a species of *Loranthus*, which grows parasitically in great abundance on the mango and other fruit trees surrounding the villages of the natives.” Dr. Horsfield also remarks, “In the imago state the peculiarity chiefly exhibits itself in the antennæ, which are abruptly terminated by a short point.” I am unaware whether this may be a peculiarity confined to Javan specimens, but have certainly been unable to see it in Ceylonese examples, at least as prominently as figured by Horsfield.

## 2. *Tajuria mantra*.† (Tab. XXI., fig. 11 ♀.)

*Pseudolycaena mantra*, Felder, Wien. Ent. Mon. iv. p. 396, n. 9 (1860).

*Myrina Mantra*, Feld. Reise Nov. Lep. ii. p. 238, n. 270, t. 30, f. 14 (1865).

*Iolaus Mantra* (var. ?), Hewits. Ill. Diurn. Lep. p. 46, n. 20, t. 20, f. 24 (1865).

\* Cat. Lep. E. I. C. t. iv. f. 5, 5a.

† The name “mantra” used by Felder for this species denotes that part of the “Veda” which has been defined by Prof. Monier Williams as “prayer and praise, embodied in texts and metrical hymns” (“Hinduism,” p. 18). It becomes a question whether it is justifiable, either in good taste or as a precedent to be followed, that ecclesiastic terms belonging to other religious systems than our own, should thus be used as specific names for insects. It cannot for a moment be believed that those alone born in Christian countries are to be the zoologists in the future, and there can be little doubt of the reception that would be accorded in this country to specific names of insects, proposed by a Hindu, on ecclesiastical terms used by the Christian Church. English entomologists, in particular, have not hesitated to ruthlessly use the most sacred names in both Buddhism and Hinduism for this purpose (Islam has somewhat escaped), and the practice logically culminated, when an American entomologist used in a similar manner the most sacred name in Judaism, to the scandal of those who did not hesitate to employ, and cheerfully use, the terms of concepts in other religious systems.

Female. Wings above pale violaceous; anterior wings with the costal margin broadly and the outer apical third of wing dark fuscous; posterior wings with the costal and posterior margins fuscous, the last widest at apex and gradually narrowing and becoming somewhat obsolete towards anal angle, where there is a blackish spot containing a few scattered bluish scales and inwardly and obscurely margined with ochraceous; a marginal greyish line from about second median nervule to anal angle, the extreme edge blackish; tail-like appendages fuscous, with their apices whitish. Wings beneath brownish-ochraceous; a narrow fuscous submarginal fascia crossing both wings, commencing on anterior wings beneath the subcostal nervules and more or less fractured at the nervules, and on the posterior wings, strongly dislocated from the upper median nervule to abdominal margin: beyond this fascia on both wings is another, obscure and subobsolete: a pale ochraceous patch on posterior wings at anal angle, with two black marginal spots containing a few scattered bluish scales, situate one between the second and third median nervules, the second at anal angle: \* between these spots are some scattered bluish scales, the margin as above.

The male is unknown to the writer, but is thus described by Felder:—

♂. “Alæ posticæ regione anali sat producta.”

“Alæ supra dilute metallico-cyanæ, anticæ margine costali dimidioque lato apicali fuscis, posticæ limbo costali et apicali fuscis, margine postico ante cilia nigro, limbo interno cano.”

“Alæ subtus cano-fuscæ, striga externa in posticis anum versus angulata fusca, multo dilutius cineta alteraque submarginali obsoleta, posticæ macula subanali alteraque anali nigris, intus late aurantiaco-flavo circumdatis, extus metallico-virenti cinetis, atomis interjectis metallico-virescentibus, linea alba ante marginem posticum.”

Exp. wings, ♀, 34 to 44 millim.

HAB.—Malay Peninsula; Malacca (Com. de Castelnau—coll. Feld.; Biggs—coll. Dist.).—Celebes; Macassar (coll. Hewits.)?†

### 3. *Tajuria relata*, n. sp. (Tab. XXI., fig. 12 ♀.)

Female. Allied to *T. mantra*, but differing in the following respects:—The wings beneath are dark greyish, and not brownish-ochraceous as in Felder's species, and the narrow fuscous submarginal fascia is rounded and outwardly convex on the anterior wings.

Male. At present unknown to the writer.

Exp. wings, ♀, 35 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.).

Although I only possess a single female specimen of this species, it is still, though closely allied to *T. mantra*, so very distinct in many important characters, as to necessitate its description as a new species.

### 4. *Tajuria travana*. (Tab. XXII., fig. 4 ♀.)

*Myrina Travana*, Hewitson, Ill. Diurn. Lep. p. 38, n. 38, t. 17, f. 59, 60 (1865); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 2 (1877).

*Sithon Travana*, Druce, Proc. Zool. Soc. 1873, p. 352, n. 9.

*Hemelana Travana*, Moore, MS.

\* This has been omitted in the figure, owing to the specimen—then only available—being in a somewhat mutilated condition.

† It is doubtful whether this form is not really a distinct species or local race.

Wings above dark fuscous; anterior wings with a large oblong streak in lower portion of cell, the greater portion of the space between the third median nervule and the submedian nervure and a streak on inner margin bright shining violet-blue; posterior wings with the lower portion of cell and the outer cellular area of the same colour; a narrow greyish submarginal line from second median nervule to anal angle, where there is a black spot inwardly containing some greenish metallic scales; tail-like appendages dark fuscous, with their apices and their margins a little beyond base greyish. Wings beneath olivaceous-brown, both wings with two dark disco-cellular lines at end of cell; anterior wings with a very dark waved line crossing outer disk, commencing at bifurcation of third and fourth subcostal nervules and terminating near third median nervule; a similar line on posterior wings, commencing near costa, strongly fractured at upper subcostal nervule, and continued to near abdominal margin; three black marginal spots, inwardly and broadly margined with resplendent metallic-green, the first small and transverse between the first and second median nervules, the second and third spots largest, between which, and separated by the third median nervule and submedian nervure, is a large patch of greyish scales also inwardly margined with the resplendent metallic-green, greyish marginal line as above near anal angle.

Exp. wings,\* 38 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.); Singapore (coll. Godfery).—Sumatra (coll. Hewits.).—Borneo (Druce).

### Genus BINDAHARA.

*Bindahara*, Moore, Lep. Ceyl. vol. i. p. 111 (1881).

Anterior wings subtriangular, the costal margin arched and slightly convex, the outer margin almost straight in the male and moderately convex in the female, the inner margin nearly straight. Costal nervure extending a little beyond end of cell; first subcostal nervule emitted a little beyond middle of cell, second about midway between bases of first and third, the third from end of cell, third and fourth bifurcating at about two-thirds the length of third; disco-cellular nervules suberect; first and second median nervules with an apparently common origin just before the end of cell, third median nervule emitted at about one-third before end of cell. Posterior wings elongately subovate, the costal margin obliquely convex, the posterior margin obliquely convex and obsolete to apex of second median nervule where it is angulated, with a very long tail-like appendage at apex of third median nervule and with a short lobular tail-like appendage at anal angle. Costal nervure extending to apex of wing, subcostal nervules bifurcating near middle of cell; first and second median nervules with an apparently common origin at end of cell, third median nervule emitted a little beyond middle of cell; submedian nervure straight, internal nervure rounded and convex. Body moderately robust. Palpi with the apical joint slender and about one-third the length of second in male and one half the length of second in female.†

This is probably a truly Oriental genus.

#### 1. *Bindahara phocides*. † (Tab. XX., fig. 25 ♀.)

*Hesperia Phocides*, Fabricius, Ent. Syst. iii. 1, p. 282, n. 85 (1793).

*Papilio Phocides*, Donovan, Nat. Rep. ii. t. 44, f. 1 (1824).

*Myrina Phocides*, Butler, Cat. Fabr. Lep. p. 183, n. 1 (1869).

\* One specimen only examined.

† Mr. Moore, in his diagnosis of this genus, has presumably given the length only of the apical joints of the palpi in a male specimen.

‡ This is not the species found in Ceylon, and figured and described by Mr. Moore as *B. phocides*, and of which he places the *B. sugriva*, Horsf., as a synonym. Horsfield's species—found both in Java and Ceylon—is, however, quite distinct, the large ochraceous anal patch and the blue marginal fascia to the posterior wings being alone well-marked differences, whilst the type specimen of *B. phocides* is contained in the Banksian collection of the British Museum, where I have examined it with Mr. Entler.

Male. Wings above dark fuliginous-brown; posterior wings with the tail-like appendages ochraceous, the smaller one at anal angle with a fuliginous spot. Wings beneath brownish-ochraceous. Anterior wings with the following castaneous markings:—a spot at base of cell, a broad outwardly curved fascia crossing cell near middle, commencing on costal nervure and continued to about the submedian nervure; between this and outer margin is another broad fascia, commencing near costal margin and narrowly terminating at submedian nervure, and a narrow, obscure and more fuscous submarginal fascia; at end of cell there is a narrow, disco-cellular castaneous streak. Posterior wings with the following castaneous markings:—a series of basal spots, two narrow and much-waved and sinuated discal fasciae crossing wing beyond middle, between which and the basal spots is a broad obscure fascia commencing on costal nervure and terminating at median nervure; a dark submarginal line at anal angle enclosing two blackish spots with scattered metallic greenish scales, and a prominent black spot on inner and shorter tail-like appendage. Body and legs more or less concolorous with wings.

Female. Wings above olivaceous-brown; posterior wings with a large white anal angular patch divided by the dark median nervules, and containing a large black marginal spot between the second and third median nervules and a smaller and much more obsolete spot at anal angle; tail-like appendages white, with black basal streaks. Wings beneath whitish; anterior wings with the castaneous markings as in male, the outer fascia narrowly margined with white, and the remaining ground colour pale castaneous; posterior wings with the markings more distinct and linear than on male.

Exp. wings, ♂, 31 to 38 millim.; ♀, 35 to 42 millim.

HAB.—Burma; Moulmein (Brit. Mus.).—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Künstler—Calcutt. Mus.); Singapore (coll. Godfery).

### Genus NEOMYRINA.

*Neomyrina*, Distant, *antea*, p. 234.

Anterior wings with the costal margin strongly arched; the outer margin nearly straight, the apex subacute, the posterior angle rounded; the inner margin slightly concavely sinuate. Costal nervure short, terminating on costal margin considerably before end of cell; first subcostal nervule emitted at about middle of cell and terminating on costal margin nearly opposite end of cell, second emitted rather nearer the base of third than first, third arising a short distance beyond end of cell, third and fourth bifurcating at about two-thirds the length of third; upper median nervule from end of cell and emitted nearer to second than second is from third, which is emitted fully two-thirds from base of median nervure. Posterior wings elongately subovate, costal margin oblique and very slightly convex, apex obtusely acute; posterior margin oblique, slightly waved, prominently angulated at apex of second median nervule, and with two tail-like appendages, one very long at apex of third median nervule, the second short and slender at apex of submedian nervure. Costal nervure about reaching apex of wing; subcostal nervules bifurcating about one-third before end of cell, disco-cellular nervules almost obsolete; first and second median nervules with an apparently common origin just before the end of cell; submedian nervure almost straight, internal nervure curved and rounded inwardly. Body short, moderately robust; palpi porrect, the second joint extending distinctly before the eyes; apical joint much more slender than second, but moderately robust.

It is necessary to form a new genus for the following species, as *Myrina*, under which it was originally placed, and the type of which is the African *M. silenus*, Fabr., possesses strongly distinct structural characters.

1. *Neomyrina hiemalis*. (Tab. XXII., fig. 13 ♀.)

*Myrina hiemalis*, Godman & Salvin, Proc. Zool. Soc. 1878, p. 640, t. 40, f. 5, 6.

Female. Wings above pearly white; anterior wings with the outer margin and a large curved apical space terminating on costal margin at about one-third from base, black; posterior wings with the posterior margin from apex to median nervules (where it becomes obsolete) black; an elongate black marginal spot on each side of second median nervule; tail-like appendages with a faint and slender central blackish line. Wings beneath pearly white, with four transverse dark greyish fasciæ with still darker margins, the first two crossing cell and terminating at median nervure, third and fourth wider and more irregular, situate between end of cell and outer margin and terminating near the third median nervule, marginal and submarginal dark greyish fasciæ, the colour between which is also dark greyish; posterior wings crossed by five irregular dark greyish macular fasciæ; the first near base consisting of five spots and terminating near base of abdominal margin, the second composed of three elongate spots, of which the lowermost two are joined and terminate between the third median nervule and submedian nervure, the third consists of four spots commencing beneath the lower subcostal nervule and recurved and terminating on abdominal margin, the fourth composed of six fused spots extending in an almost straight line from costal margin to third median nervule, and the fifth submarginal, recurved and extending to abdominal margin; a marginal dark greyish fascia extending from apex to upper median nervule, followed by an elongate black marginal spot, a dark bluish spot between second and third median nervules, two small bluish spots between that nervule and submedian nervure, and a large bluish spot shaded with black at anal angle, above which the submarginal fascia is also tinged with bluish; tail-like appendages as above; body above pale greenish, beneath with legs more or less concolorous with wings.

Male. This sex, as figured by Godman and Salvin, and described in error as a female, differs from that sex in having the apical area of the upper surface of the anterior wings bluish, the outer margin being only black; the posterior margin of the hind wings is also only slightly marked with blackish; wings beneath as in female.

Exp. wings, ♂ "2.2 inches";\* ♀ 50 millim.

HAB.—Burma; Meetan (Hume—coll. Godm. & Salvin).—Malay Peninsula; Perak (Künstler—coll. Semper).

I am much indebted to Herr Georg Semper, of Altona, for the loan of this female Perak specimen, which is the only example of the species—as far as I am aware—yet received from the Malay Peninsula.

## Genus PURLISA, gen. nov.

*Purlisa*, Distant, *antea*, p. 234.

Anterior wings subtriangular, the apex subacute; costal margin arched and convex; outer margin nearly straight, very slightly concave; inner margin nearly straight, very slightly concavely sinuate. Costal nervure short, terminating on costa before the end of cell; first subcostal nervule emitted near middle of cell and terminating on costa a little beyond end of cell, second about midway between bases of first and third, the last of which is emitted a little before end of cell, third and fourth bifurcating at about two-thirds the length of third; first median nervule curved and emitted from end of cell, second and third straight and nearly twice the distance apart as second is from first. Posterior wings elongately and irregularly subtriangular, the costal margin convex, the posterior margin oblique, abdominal margin

\* As given by Godman and Salvin.

acutely cleft near anal angle, posterior margin with a long tail-like appendage at apex of submedian nervure, and a short one at apex of lower median nervule. Costal nervure not quite reaching apex of wing, the subcostal nervules bifurcating a little before the end of cell, first and second median nervules with an apparently common origin near end of cell. Palpi long and porrect, second joint robust, clothed with short adpressed hairs and extending more than half its length in front of eyes, apical joint moderately slender and about half the length of second; antennæ with a very slender and gradually formed apical club. *Legs mutilated.*

Although the name of this genus has appeared before,\* it has not been previously described, and was used by Mr. Waterhouse in error. I originally described the typical species under the name of *Iolaus* (*Purlisa*) *giganteus*,† the name *Purlisa* being a proposal of Mr. Moore, but in 'Aid' the name "*Iolaus*" was discarded, and the hitherto unpublished name of "*Purlisa*" alone substituted.

### 1. *Purlisa gigantea*. (Tab. XXI., fig. 28.)

*Iolaus* (*Purlisa*) *giganteus*, Distant, Ent. Month. Mag. vol. xvii. p. 245 (1881).

*Purlisa gigantea*, Waterh. Aid Ident. Ins. vol. i. t. 46 (1882).

Wings above brilliant cerulean-blue; anterior wings with the basal third of costal margin dark greyish-fuscous, and from which the whole apical area (concave internally) to near apex of inner margin is black; posterior wings with the outer margin broadly black, the fringe greyish-white, abdominal margin greyish, anal angle fuscous, irrorated with bluish scales, outwardly margined with white, and followed by a dark line separating the fringe, tail-like appendages fuscous, margined with greyish-white. Wings beneath smoky-grey, both wings crossed by a submarginal narrow dark fascia, commencing on anterior wings about midway between end of cell and outer margin, sharply defined outwardly and evanescent inwardly, waved but entire on anterior wings, and deeply sinuate towards anal angle of posterior wings; a pale marginal border containing some obscure elongate spots on anterior wings and a double row of smoky elongate spots on posterior wings; a black submarginal spot faintly margined with bluish between the second and third median nervules, and a larger spot of the same colour at anal angle; fringe as above. Body and legs more or less concolorous with wings.

Exp. wings, 52 millim.

HAB.—Malay Peninsula; Penang (coll. Dist.).

This appears to be an exceedingly rare species. I possess but one specimen, and the only other example which I have seen is a much mutilated and unlocalised one in the collection of Mr. F. Moore, where it has been for the last twenty years. During this time it has frequently excited the interest of the owner and the late Mr. Hewitson, but its condition prevented its proper determination.

### Genus CHERITRA.

*Cheritra*, Moore, Lep. Ceyl. vol. i. p. 109 (1881).

Anterior wings subtriangular, the costal margin arched and convex, the outer margin nearly straight, the inner margin nearly straight, but slightly concavely sinuate. Costal nervure terminating on costa nearly opposite end of cell, first subcostal nervule emitted at about middle of cell, second

\* Aid to Ident. Ins. vol. i. t. 46.

† Ent. Month. Mag. vol. xvii. p. 245.



emitted at about the same distance from first as second is from third, the last of which is emitted a little before the end of cell, third and fourth bifurcating at nearly two-thirds the length of third; first median nervule emitted at end of cell, the bases of the second and third being twice as far apart as those of first and second. Posterior wings irregularly and elongately subovate, the costal margin obliquely convex, the posterior margin oblique, angled and produced at area of median nervules, and with a long tail-like appendage at apex of lower median nervule and a shorter one at apex of submedian nervule; abdominal margin somewhat oblique, deeply and acutely excavated near anal angle. Costal nervule not quite reaching apex of wing, subcostal nervules bifurcating at about one-third before end of cell; first and second median nervules with an apparently common origin near end of cell. Palpi very similar to those of *Purlisa*.

Male with a tuft of fine hairs at base of inner margin of anterior wings, concealing a glandular patch at base of costal area of posterior wings.

In the synopsis of genera (p. 234) I have unfortunately given the length of the costal nervule to posterior wings as found in "*Cheritra amrita*," a species which I have since found cannot be included in *Cheritra*, and for which I have proposed a new genus under the name of *Neocheritra*.

### 1. *Cheritra freja*. (Tab. XX., fig. 10 ♀.)

*Hesperia Freja*, Fabricius, Ent. Syst. iii. 1, p. 263, n. 19 (1793).

*Myrina Freja*, Butl. Proc. Zool. Soc. 1867, pp. 34, 36, f. 1; Cat. Fabr. Lep. p. 183, n. 2 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 8 (1877); Moore, Proc. Zool. Soc. 1878, p. 834.

*Sithon Freja*, Druce, Proc. Zool. Soc. 1873, p. 351, n. 3.

*Myrina Jaffra*, Horsf. (nec. Godt.), Cat. Lep. E. I. C. p. 118, n. 48, t. 2, f. 5, 5a (1829).

Female. Wings above fuliginous-brown; posterior wings with three large submarginal white spots, separated by the second and third median nervules, beneath the two outermost are two marginal white lines, and beneath the innermost a marginal white spot, fringe beneath these spots also white; tail-like appendages white, with a central fuscous line; abdominal margin at anal angle more or less spotted with white. Wings beneath greyish; anterior wings with the costal, apical and outer marginal areas pale ochraceous, with a disco-cellular and two discal submarginal darker ochraceous lines; posterior wings with two wavy, fuscous submarginal linear fasciæ, darker and more broken towards anal area; these are followed by a brownish submarginal line from apex to discoidal nervule, two black linear spots divided by the upper median nervule, and a large black spot inwardly margined with bluish between the second and third median nervules, a bluish transverse spot between the lower median nervule and submedian nervule, a small black spot at anal angle, from which a bluish streak, outwardly margined with black, extends to lower portion of abdominal margin. Body and legs more or less concolorous with wings.

Exp. wings, ♀, 40 to 50 millim.

HAB.—Burma; Moulmein (Moore).—Upper Tenasserim; Taoo (Moore).—Malay Peninsula; Penang (Pinwill—Brit. Mus.); Province Wellesley (coll. Dist.).—Java (Horsf.).—Borneo (Druce).

I have not seen the male of this species, which is described by Horsfield\* as "covered with a beautiful saturated cupreous gloss slightly varying to purple," and as having the posterior wings "marked with two white spots, one large, lunulate and marginal, the other oblong, narrow, and exactly opposed to the exterior one at the inner boundary of the anal region."

The species also varies in size, as the above dimensions of female specimens in my own collection testify.

\* Cat. Lep. E. I. C. p. 119.

## Genus NEOCHERITRA, gen. nov.

Allied to *Cheritra*, but with the costal nervure of the posterior wings terminating at about two-thirds of costal margin, the subcostal nervules of the posterior wings emitted a little before end of cell, and the position of the tail-like appendages reversed, the long one being at the apex of the submedian nervure, and the shorter one at the apex of the lower median nervule.

1. *Neocheritra amrita*. (Tab. XX., fig. 15 ♀, and Tab. XXIII., fig. 12 ♂.)

*Myrina Amrita*, Felder, Wien. Ent. Mon. iv. p. 395, n. 2 (1860); Hew. Ill. Diurn. Lep. p. 27, n. 1, t. 11, f. 1—3 (1863); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 7 (1877).

*Sithon Amrita*, Kheil, Rhop. der Insel. Nias. p. 32, n. 105 (1884).

Male. Wings above violaceous-blue, more or less dusted with fuscous; anterior wings with the costal margin and rather more than the apical half black; posterior wings with the outer margin black, broadest at apex and containing three submarginal transverse pale spots, the two uppermost pale bluish and separated by the second median nervule, the third white and situate between the lower median nervule and the submedian nervure, where above the black margin is also a pale greyish spot, and above the upper median nervule there is a discal black fascia, anal angle white, containing a small black spot; tail-like appendages greyish-white, with an indistinct central pale fuscous line; tuft of hairs at base of inner margin of anterior wings greyish with an ochraceous tinge. Wings beneath pale greyish; anterior wings with the whole cellular and outer areas pale reddish-ochraceous; posterior wings with the costal and apical areas pale reddish-ochraceous with two series of black spots, one marginal and separated by the nervules commencing near discoidal nervule, the other and preceding series consisting of three transverse spots separated by the lower median nervule and the submedian nervure; tail-like appendages with their bases blackish and with a central fuscous line; body and legs more or less concolorous with wings.

Female. Wings above dark fuliginous-brown; posterior wings with the black and white markings at anal angular area as in male, but with the white markings larger, or sometimes, as in the figure here given, with the white area and the black spots therein much larger; tail-like appendages greyish-white, with prominent central fuscous lines. Wings beneath as in male, but with the black markings at anal angular area somewhat larger.

Exp. wings, ♂ and ♀, 40 to 44 millim.

HAB.—Malay Peninsula; Malacca (Biggs—coll. Dist; Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.; coll. Godm. and Salv.).—Nias Island (Kheil).

The female specimen here figured is from Singapore, and contained in the collection of Messrs. Godman and Salvin. It exhibits the maximum of varietal character as observed in the species, and which appears to be found in the extent of the black and white markings on the anal angular area of the upper surface of the posterior wings. Although *C. amrita* is only recorded here from the Malay Peninsula it is probable that its geographical distribution will be proved to be of a wider description, the *Lycanidae*\* of the Malayan Archipelago having still to be properly described and enumerated.

\* Mr. P. H. Gosse has written to me that, on p. 196, I should have cited him *literatim*, and should have used the word *Lycanadae*, as he would reject the use of "a Greek patronymic in *idae*, from a noun of the first declension. *Lycæna* should make *Lycanadae*." My friend is doubtless correct on the point, though I expect the more corrupt word "*Lycanidae*" will prevail. Should a day of literary purification ever arise the requisite change of well-known words in our literature will be not inconsiderable. Even so careful and great a writer as Milton has been recently shown, by the late Mark Pattison, to have erred in his title of 'Il Penseroso,' the adjective formed from '*Pensiero*' being '*Pensieroso*' (Milton, p. 23).

## Genus SITHON.

*Sithon*, Hübner, Verz. bek. Schmett. p. 77 (1816); Moore, Proc. Zool. Soc. 1883, p. 526.

Anterior wings subtriangular, the costal margin arched at base, the apex subacute, the outer margin very slightly convex, posterior margin slightly convex and provided (in male) with a tuft of hairs near base. Costal nervure sinuate, terminating on costa near end of cell, first subcostal nervule impinging on the costal nervure and emitted at about one-third before the end of cell, second emitted about midway between bases of first and third, the last near end of cell, first and second median nervules with an apparently common origin near end of cell. Posterior wings subovate, costal margin at about one-third from base suddenly deflected and oblique to apex, posterior margin oblique, somewhat widened and lobular at apex of second median nervule, with a slender tail-like appendage at apex of lower median nervule, and a shorter and more lobate one at apex of submedian nervure, abdominal margin oblique, rounded and not cleft at anal angle, subcostal nervules bifurcating at about one-third before end of cell. Palpi porrect, second joint extending about half its length beyond the head, third slender, about or a little less than half the length of second. Body long and moderately robust. Antennæ moderately long, with a slender but well-formed apical club.

As known at present, this genus seems to be distributed in an area comprising Bengal, the Malay Peninsula, Java and Sumatra.

1. *Sithon nedymond*, var. (Tab. XXII., fig. 1 ♂.

*Papilio Nedymond*, Cramer, Pap. Ex. iv. t. 299, E, F (1782).

*Thecla Nedymond*, Horsf. Cat. Lep. E. I. C. p. 96, n. 28 (1829).

*Sithon Nedymond*, Hübner, Verz. bek. Schmett. p. 77 (1816); Moore, Proc. Zool. Soc. 1883, p. 526.

Male. Wings above dark fuscous or black; anterior wings with a large discal dark bluish patch, not extending to base nor above the subcostal nervure, and outwardly reaching to about one-third between end of cell and margin; posterior wings with the outer margin very broadly of the same hue; tail-like appendages dark fuscous, the outermost with its apical third whitish, the innermost with a longitudinal pale bluish streak. Wings beneath pearly-grey, the outer third of both wings chocolate-brown, of which the innermost portion consists of a broad and somewhat straight darker brown fascia, the posterior wings with a marginal greyish line; at anal angle of posterior wings the brown is replaced by ochraceous and contains four bluish streaks margined with black, situate one between the second and third median nervules, two between the third median nervule and submedian nervure, and the fourth oblique, between the submedian and internal nervures: above these and between the third median nervule and internal nervure is a transverse black streak inwardly containing some ochraceous markings: between the first and second median nervules is an obscure dark spot containing a few pale bluish scales and outwardly margined with ochraceous. Body above and beneath more or less concolorous with wings; legs pearly-grey, streaked and annulated with dark fuscous; palpi pearly-grey, with their apices dark fuscous.

Exp. wings, 34 millim.

HAB.—Malay Peninsula; Sungei Ujong (coll. Godfery).—Sumatra (Brit. Mus.).—Java (Horsf.).

I have only seen one specimen of this species from the Malay Peninsula, which Mr. Godfery writes me that he caught "in a forest-path near the banks of the Linggi in Sungei Ujong." It is evidently an extremely rare species. I have no knowledge of the female,\* and have

\* If it is not to be found in the following species?

treated the form here figured as a variety, owing to the transverse black streak above the anal angle on the under surface of the posterior wings containing some ochraceous markings not observed in typical Javan specimens.

2. *Sithon chitra*. (Tab. XXIII., fig. 15 ♀.)

*Thecla Chitra*, Horsfield, Cat. Lep. E. I. C. p. 97, n. 29, t. 1, f. 5 (1829).

*Myrina Chitra*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 51, n. 87 (1857); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 3 (1877).

I have not received this species myself\* from the Malay Peninsula, but have figured a Malaccan specimen contained in the British Museum, and have copied the original description of Dr. Horsfield.

“Surface *above* dark brown, with a very slight ferruginous lustre, being paler on the disk and more saturated at the borders; in the hinder pair the anal region is covered by a broad white patch, confined posteriorly by a delicate black marginal thread, and bearing two irregularly round black spots, the exterior one being dotted with white; the anal appendage bears a black dash, attenuated interiorly and marked laterally with a greenish silvery line; the extreme fringe of the hinder pair and the tails throughout being white; *underneath* the *anterior wings* are fulvous, the *hinder* silvery white, with a broad fulvous posterior border, attenuated towards the anal region, and continued by a narrow striga passing irregularly flexuose to the inner margin; the anterior wings are paler at the base, have an obscure yellowish litura on the disk, behind this a curved brown striga, increasing in breadth and intensity of tint towards the interior margin, and finally a black marginal thread; the hinder pair have a very delicate linear yellowish transverse streak on the disk, a medial band of brown dots, more saturated near the costa, and continued at the inner boundary of the anal areola by a very deep black broad regularly transverse streak, tending to the inner margin, and accompanied, a little above its termination, by a solitary black dot; the anal region is interiorly bounded by a series of diversified marks of an intense black colour, disposed in a simple curve; it commences, near the outer apical angle, with an oblong black streak touching a wedge-shaped streak with a minute dash of green silvery irrorations at its inner extremity; this is followed by two large irregularly defined black spots, which also appear on the upper surface, the exterior one being bordered at its inner margin by a crescent of silvery irrorations, the next divided into two portions by the passage of the fulvous striga, bearing near the middle two silvery lunules opposed to each other; the series is terminated by a black streak, extending in contact with the fulvous band along the oblique portion of the inner margin, being nearly concealed by a corresponding streak of silvery irrorations; the anal appendage is black, and surrounded by a lax ciliated white fringe which is broader internally; the *thorax* and *abdomen* are brown above and white underneath, the latter being banded at the sides; the *feet* are white, annulated with black; the *antennæ* are also delicately annulated, and the club has a broad white ring at its base and a ferruginous tip.”

Exp. wings, ♀, 32 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.); Singapore (Brit. Mus.).—Java (Horsfield).

Dr. Horsfield's description evidently applies to a female specimen, and of the male sex I can find no account. It probably has a bluish gloss above, and is evidently allied to the preceding species. What is the female of *S. nedymond*? and what is the male of *S. chitra*? There is certainly no great reason why the two species (?), as at present known, should not be

\* Since this was written I have received a female specimen from Sungei Ujong, which has enabled me to certify its generic position.

classed as male and female *S. nedymond*. The only reason why that course is not followed here, is owing to the fact, that the female *S. chitra* has a more curved upper tail-like appendage than the male *S. nedymond*, and the ground colour beneath being somewhat diverse. When the insects are bred the above supposition may not improbably prove correct.

### Genus HYPOLYCÆNA.

*Hypolycæna*, Felder, Wien. Ent. Mon. vi. p. 293 (1862); Moore, J. A. S. Beng. vol. liii. pt. ii. no. 1, p. 14 (1884).

Anterior wings subtriangular, costal margin arched at base, the apex subacute, outer margin slightly convex, inner margin slightly concave. Costal nervure terminating nearly opposite end of cell; first subcostal nervule emitted a little beyond middle of cell, second a little closer to first than third, the last of which is emitted a little before end of cell, which reaches to about the middle of wing; first and second median nervules emitted close together at end of cell. Posterior wings subovate, the costal margin at a short distance from base oblique to apex, which is rounded, outer margin oblique, slightly waved and produced at second median nervule and with two slender tail-like appendages, one at apex of third median nervule and the other at apex of submedian nervure; abdominal margin somewhat concavely cleft near anal angle, which is moderately lobular. Costal nervure strongly arched at base and reaching apex of wing, first subcostal nervule emitted at about one-third before the end of cell; first and second median nervules with an apparently common origin at end of cell. Palpi porrect, second joint stout, but scarcely extending before the eyes, third joint slender, very long, of nearly equal length to second; antennæ moderately long, with a gradually thickened but well-formed apical club.

This is a widely distributed genus, and extends from Continental India through the Malay Peninsula, and throughout the Malayan Archipelago. It is also probably common to Tropical Africa, a number of species found there being apparently congeneric.

#### 1. *Hypolycæna erylus*. (Tab. XX., fig. 5 ♂; 6 ♀.)

*Polyommatus Erylus*, Godart, Enc. Méth. ix. p. 633, n. 60 (1823).

*Amblypodia Erylus*, Horsf. Cat. Lep. E. I. C. p. 111, n. 43 (1829).

*Myrina Erylus*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 50, n. 84 (1857).

*Hypolycæna Erylus*, Hew. Ill. Diurn. Lep. p. 49, n. 1, t. 21, f. 1, 2, 4 (1866); Druce, Proc. Zool. Soc. 1873, p. 351, n. 1; Wood-Mas. & de Nic. J. A. S. Beng. vol. xlix. p. 232, n. 44 (1880); de Nic. J. A. S. Beng. vol. l. pt. ii. p. 52, n. 48 (1881); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 1 (1877); Moore, J. A. S. Beng. vol. liii. pt. ii. no. 1, p. 15 (1884); Kheil, Rhop. der Insel. Nias, p. 31, n. 97 (1884).

*Hypolycæn Andamana*, Moore, Proc. Zool. Soc. 1877, p. 589.

*Hypolycæna Erylus*, Snell. Tijd. Ent. xxi. p. 23, n. 95 (1878).

Male. Wings above dark indigo-blue; anterior wings with a discal patch of blackish scales at end of cell; posterior wings with a whitish submarginal line extending from second median nervule to anal angle; fringe greyish; tail-like appendages with their margins pale greyish; a dark spot at anal angle margined with white. Wings beneath dark grey, tinged with greenish. Anterior wings with two brown disco-cellular lines at end of cell, followed by a narrow dark brown fascia, margined with greyish, commencing near costa and terminating at the submedian nervure, and a paler brownish submarginal fascia, between which and the outer margin the colour is more or less tinged with brownish; fringe brown, tipped

with greyish. Posterior wings with two brownish lines at end of cell, followed by a dark fascia as on anterior wings, but more or less dislocated at the nervules, especially between the first median nervule and the abdominal margin, and duplex near anal angle; two pale brownish submarginal fasciæ, a large ochraceous patch containing a black spot between the second and third median nervules, and a black spot at anal angle—between these spots is a patch of metallic bluish scales—; extreme margin black, narrowly bordered on each side with whitish; fringe as on anterior wings. Body above more or less concolorous with wings; beneath greyish; legs greyish, broadly annulated with black. Antennæ black, annulated with greyish, the apex castaneous.

Female. Wings above fuliginous-brown; both wings with the dark discal fascia beneath more or less distinctly visible above; posterior wings with the anal area pale greyish, traversed by two submarginal fuliginous fasciæ, the outermost beyond the second median nervule consisting of three large spots, the third at lobe of anal angle: tail-like appendages fuliginous, margined with greyish. Wings beneath as in male, but somewhat paler in hue.

Exp. wings, ♂, 28 to 36 millim; ♀, 30 to 38 millim.

HAB.—Continental India; N.E. Bengal, Sikkim, Khaisa Hills, Cherra Punji (Moore).—Andaman Islands (Wood-Mas. & de Nic.).—Burma (Moore).—Malay Peninsula; Penang, Province Wellesley (coll. Dist.); Perak (Townsend—coll. Godm. & Salv.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (Wallace—coll. Godm. & Salv.; Kerr—coll. Dist.).—Nias Island (Kheil).—Java (Horsf.).—Borneo (Druce).—Celebes (Snellen); Macassar (coll. Hewits.).

*H. erylus* is probably distributed throughout the Malay Archipelago, and is in all its recorded habitats a moderately abundant species. I have always received the sexes in unequal proportion, male specimens predominating, and Mr. de Nicéville, when collecting in Sikkim, in October, 1880, found the “males very common all through the Terai and up to Chunabatti,” but “only one female taken.”\* It is a species little subject to variation, as is evident from the series from different habitats in my own collection, and, as found in the Andamans, Messrs. Wood-Mason and de Nicéville remark, “Absolutely indistinguishable from fresh Sikkim specimens.” †

## 2. *Hypolycæna etolus*. (Tab. XX., fig. 23 ♂.)

*Papilio Etolus*, Fabricius, Mant. Ins. ii. p. 66, n. 620 (1787); Ent. Syst. iii. p. 264, n. 20 (1793).

*Amblypodia Etolus*, Horsf. Cat. Lep. E. I. C. p. 115, n. 46; Thecla E. l. c. t. 1, f. 9 (1829).

*Myrina Etolus*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 49, n. 82 (1857); Butl. Cat. Fabr. Lep. p. 183, n. 3 (1869).

*Hypolycæna Etolus*, Hewits. Ill. Diurn. Lep. t. 22, f. 19, 20 (1865); Druce, Proc. Zool. Soc. 1873, p. 351, n. 2; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 2 (1877); de Nic. J. A. S. Beng. vol. L. pt. 11, p. 59, n. 105 (1881); Kheil, Rhop. der Insel. Nias, p. 31, n. 98 (1884).

*Hypolycæna Amasa*, Hewits. Ill. Diurn. Lep. p. 51, n. 8 (1865).

Male. Wings above very dark indigo-blue or blackish, base of anterior wings and whole area of posterior wings, excluding apex and two submarginal spots (one between second and third median nervules and one at anal angle) pale bluish, with a greyish tinge; fringe of posterior wings and tail-like appendages greyish, the last with a faint central bluish line. Wings beneath very pale bluish, with a greyish tinge; anterior wings with the apical half more or less ochraceous, and with the following darker ochraceous markings:—two short contiguous lines at end of cell, followed by two transverse fasciæ, the innermost of which is most distinct; posterior wings with the apex and two outer waved and dislocated narrow fasciæ ochraceous,

\* J. A. S. Beng. vol. L. pt. ii. p. 52 (1881).

† Ibid. vol. xlix. p. 232 (1880).

these fasciæ becoming more or less fuscous on inner half of wing; two somewhat faint ochraceous lines at end of cell; a black spot near base; and some submarginal blackish spots, the two largest corresponding with the position of those above. Body more or less concolorous with wings; legs greyish, broadly annulated with black; antennæ black, narrowly annulated with greyish.

Exp. wings, ♂, 26 to 32 millim.

HAB.—Continental India; Sikkim (de Nic.); N.E. Himalaya (coll. Dist.).—Malay Peninsula; Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.).—Nias Island (Kheil).—Java (Horsf.).—Borneo (Druce).

The female of this species appears to be particularly scarce, and I have not as yet received it. Mr. de Nicéville states that *H. etolus* is very common in Sikkim, that “it is a rapid flyer, and on the wing at once reminded me of the common blue-bodied Dragon-flies which abound everywhere near water;” and asks, “is it possible that a butterfly has ‘mimicked’ a *Libellula*?”\*

### 3. *Hypolycæna tharis*. (Tab. XX., fig. 19.)

*Oxytides Tharis*, Hübner, Zutr. Ex. Schmett. f. 883, 884 (1837).

*Myrina Tharis*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 47, n. 78 (1857); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 6 (1877).

*Sithon Tharis*, Kheil, Rhop. der Insel. Nias, p. 32, n. 108 (1884).

Wings above dark chocolate-brown; anterior wings with two obscure streaks of scattered bluish scales situate one on each side of submedian nervure; posterior wings with a transverse macular white fascia crossing wing from apex of lower subcostal nervule to notch at anal angle; beneath this is a white spot at anal angle and a narrow submarginal white line, fringe white, submedian nervure tinged with greyish; tail-like appendages white, with faint dark central lines. Wings beneath ochraceous, the anterior wings reddish ochraceous; posterior wings with the anal angular area largely white, anteriorly defined by a wavy blackish line bordered with greyish, and from which some very obscure narrow pale linear fasciæ radiate towards costa; this white area includes the following black spots:—a submarginal row of six, of which the first, second and fifth are small and linear; above the fifth and sixth is a broad irregular spot and another is placed above notch at anal angle; fringe and tail-like appendages as above. Body more or less concolorous with wings; legs greyish, broadly annulated with black; antennæ dark fuscous, narrowly annulated beneath with greyish.

Exp. wings, 28 to 32 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Künstler—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.).—Nias Island (Kheil).—Java (Horsf.).

### 4. *Hypolycæna thecloides*.

*Myrina thecloides*, Felder, Wien. Ent. Mon. iv. p. 395, n. 3 (1860).

*Hypolycæna thecloides*, Hewits. Ill. Diurn. Lep. p. 49, n. 4, t. xxii. figs. 9, 10 (1869);

Wood-Mas. & de Nic., J. A. S. Beng. vol. li. pt. ii. p. 17, n. 47 (1882);

Moore, J. A. S. Beng. vol. liii. pt. ii. n. 1, p. 16 (1884).

Not having seen this species I have copied Felder's original diagnosis, and reproduced Hewitson's figure of the same.

“Alis supra fuscis, posticis bicaudatis, fascia anali fulva, subtus omnibus glauco-albis, litura discali geminata strigaeque exteriori anticarum continua, FIG. 78.—*Hypolycæna thecloides*.



\* J. A. S. Beng. vol. L. pt. ii. p. 59 (1881).

posticarum bis refracta aurantiacis albo cinctis, anticis extus fulvescentibus, posticis macula subcostali concolore binisque analibus atris, exteriore in areola fulva. ♂.

“Colore Theclis quibusdam haud absimilis.”

Exp. wings,\* 36 millim.

HAB.—Nicobar Islands; Nankouri, Katschall (Wood-Mas. & de Nic.).—Malay Peninsula; Malacca? (Feld.); Singapore (coll. Hewits.).

There seems little doubt that this species is rightly placed in the genus *Hypolycaena*, though I have not examined a specimen. Hewitson's figure of *H. thecloides* gives a congeneric impression, whilst the structural remarks † added by Felder emphasise that view.

### Genus IRAOTA.

*Iraota*, Moore, Lep. Ceyl. vol. i. p. 101 (1881).

Anterior wings subtriangular; costal margin arched at base and then obliquely continued to apex, which is subacute; exterior margin moderately convex and slightly waved; inner margin slightly concavely sinuate. Costal nervure curved, terminating nearly opposite end of cell; first subcostal nervule emitted near middle of cell, second about midway between first and third, third emitted at about the same distance from end of cell as its base is from that of second, third and fourth bifurcating a little beyond middle of third; first and second median nervules emitting rather more than one-third nearer together than second and third. Posterior wings short and broad; costal margin obliquely convex to apex; posterior margin convexly rounded, with a slender tail-like appendage at apex of submedian nervure in the male, and with an additional and similar appendage at apex of lower median nervule in the female; anal angle lobately produced, and a somewhat prominent angulation at apex of second median nervule. Costal nervure arched at base and extending to apex; subcostal nervules bifurcating at about one-third before end of cell; first and second median nervules emitted close together near end of cell; third at about one-third before end of cell. Body robust; palpi porrect, second joint about reaching apex of head, third joint long and slender; legs robust; antennæ with a long and gradually formed apical club.

The male, as described by Mr. Moore, possesses “a tuft of hair on underside of posterior margin” of anterior wings, and also “a slightly indicated glandular space between the base of costal and subcostal veins” of posterior wings.”

This genus is of moderate extent, and is recorded from North-Eastern India, Ceylon, the Malay Peninsula, Java, Borneo, and the Philippine Islands. It is probably to be found throughout the true Indo-Malayan region.

#### 1. *Iraota boswelliana*, † n. sp. (Tab. XXII., fig. 23 ♀.)

Male. Wings above dark fuscous; anterior wings with a large patch of dark bluish scales occupying base of cell and extending along inner half, but not reaching outer margin; posterior wings with a very large and similar dark bluish patch occupying the whole discal area; tail-like appendage and the

\* Taken from Hewitson's figure.

† “Species hæc et ejus affinis *M. crylus*, Godt., et *Sipylus*, Feld., a *Myrinis* palporum articulo secundo capite brevior, tertio longo aciculari arcuato antennisque graciliter clavatis recedunt.”

‡ In naming this species I have taken a hint from Dr. Johnson. The great lexicographer once remarked to his future biographer, *a propos* of a moth which fluttered into a candle, “That creature was its own tormentor, and I believe its name was Boswell.” This is probably the whole condensed “entomological” observation of Dr. Johnson, and as such may be remembered.



angulation at apex of second median nervule dark fuscous, with the apex greyish-white. Wings beneath warm brownish, shaded with purple. Anterior wings with seven white spots, situate one largest and elongate in cell, one at end of cell, and five in somewhat curved series between end of cell and outer margin, of which the third is the largest and extends outwardly, and a submarginal, somewhat obscure, macular series of small greyish spots; towards inner margin the ground colour becomes much paler. Posterior wings with the basal half dark purplish, bounded by a central silvery white fascia, which is widest at abdominal margin and contains some irregular purplish markings; the basal dark purplish area also contains two silvery white fasciae, the first short and costal, the second very large, extending from near base of abdominal margin to apex, with a concave depression above and a narrow central continuation beneath, which reaches the central silvery fascia; beyond this the colour is ochraceous, with some purplish marginal spots, bordered with white near apex, and a broad bluish marginal fascia bordered with white, extending from about upper median nervule to anal angle, and containing a darker spot at either end. Body above and beneath more or less concolorous with wings; legs pale brownish.

Female. Wings above pale uniform ochraceous-brown, the costal area of the posterior wings paler, the tail-like appendages and angular prolongation darker brown, with their apices greyish. Wings beneath as in male, but brighter in hue and markings.

Exp. wings, ♂, 35 to 38 millim.; ♀, 45 millim.

HAB.—Malay Peninsula; Penang (Brit. Mus.); Singapore (coll. Godfery).

Although the female is decidedly larger than the male it is probable, if a large series could be measured, that the diversity is not so great as the above dimensions advocate. The male also possesses a more elongate appearance than the female, but I was unable to figure one when the plate was executed.

Considerable confusion has ensued by several distinct species having for a long time been placed under one name. Thus Mr. Hewitson\* has not only considered *I. timoleon*, Stoll, *I. rochana*, Horsf., and *I. lazarena*, Feld., as one species, but has also included the species described here, as is evident from the mention of Penang as a locality. In this opinion he has been copied by Mr. Kirby.† All these species are, however, clearly distinct and easily determinable by the emphatic markings on the under surface of the wings, which, in the *Rhopalocera*, are the surest guide for specific difference.‡

### Genus NARATHURA.

*Narathura*, Moore, Proc. Zool. Soc. 1878, p. 835.

*Nilasera*, Moore, Lep. Ceyl. vol. i. p. 114 (1881).

Anterior wings ample; costal margin more or less convex, either oblique towards apex as in *N. centaurus*, or convexly depressed towards apex as in *N. amphimuta*; exterior margin more or less convex; inner margin slightly concavely sinuate. Costal nervure short, terminating at about one-third of costal

\* Ill. Diurn. Lep. p. 25 (1869).

† Cat. Diurn. Lep. p. 418 (1871).

‡ Amidst the present creation of specific names, which seem in many cases to be the only reason why certain insects are called by the term "species,"—that *pons asinorum* of so many naturalists,—it is refreshing to see clearer views being sometimes enunciated. Thus quite recently Mr. W. F. de Vismes Kane ('Naturalist,' November, 1884, p. 73) has well remarked:—"From one point of view there is no such a thing as variation of species; since the most rigid and painstaking scrutiny of Nature leads, little by little, slowly but inevitably, it seems to me, to the conclusion that there is no such a thing as species, if we mean by the term a primeval type which has permanent and unaltered persistence of characteristics."

The evolution of species appears to have been always admitted by the older anthropologists, for who can doubt the modifying and constructive power in Nature which has produced the diverse races of mankind, and deny that the same cause has been inoperative or ineffectual in the case (say even) of butterflies.

margin; first subcostal nervule emitted at about one-third from base, and terminating on costa a little beyond end of cell, second emitted about midway between first and third, the last of which arises at about an equal interval from end of cell, third and fourth bifurcating at about middle or two-thirds of third; first and second median nervules about one-third nearer together than second and third, the first convexly rounded. Posterior wings broad, the costal and outer margins convex, with a short tail-like appendage at apex of third median nervule, either distinct as in *N. centaurus*, or short, fragile, and obscure as in *N. amphimuta*; anal angle obliquely rounded and not lobed. Costal nervule about reaching apex of wing; subcostal nervules bifurcating at about one-third before end of cell; first and second median nervules emitted somewhat close together near end of cell; lower median nervule at about one-third before end of cell. Body robust; palpi porrect, second joint compressed and flattened. Antennæ very slightly and gradually thickened at apex.

I have failed to find any structural differences between the two genera *Narathura* and *Nilasera*, as proposed by Mr. Moore, and, although the first and earliest name is here used, it is not without some hesitation, as no single character of neurulation is given in the diagnosis of *Narathura*, and it can only be accurately determined by the fact of the typical species (*Amblypodia hypomuta*, Hewits.) being given.

This genus and the two following, *Panchala* and *Amblypodia*, have till quite recently been classed and catalogued together as one genus under the last-mentioned name. As, at present, all the species thus treated have not been examined to ascertain their true generic position, it will be better to deal with them corporately in ascertaining their geographical distribution. This distribution is distinctly Oriental, and not only includes Continental India, the neighbouring islands, and the Malay Peninsula, but also the entire length and breadth of the Malayan Archipelago.

Another strongly marked peculiarity of these genera is their singular individuality, both in depth and intensity of hue and general increase of size, compared with the remaining *Lycaenidae*, which affords some support to the theory that climate has a tendency to influence coloration. This principle can of course have no universal application, as in the Tropics we find no diminution of pale-coloured butterflies. The true test seems to be this, whether we can observe, in different groups, that the most melanic members of those groups are found in the region of the Tropics, whilst at the same time the most albinic species are discovered only in the highest latitudes to which the distribution of the group extends.\* The whole question, however, still requires a further amount of material and a patient and qualified investigation.

One other feature of this deep blue coloration is not to be neglected, and that is its recurrent character throughout the Rhopalocera. In families whose members have a generally sombre hue it usually appears in an unexpected, complete and brilliant manner, and in

\* Mr. de Vismes Kane has recently advocated this view as the result of his study of European Lepidoptera ('Naturalist,' Nov. 1884, p. 77). The result of other investigations has pointed to similar considerations, in which, however, the controlling or exciting cause has been rather that of southern latitude than of tropical heat. Thus Prof. Milne-Edwards pursued a course of studies on the colour of birds as connected with their geographical distribution, and found that birds with black plumage are found in almost all parts of the world; but in certain widely distributed families the tendency to melanism is displayed only in the southern hemisphere, and especially in the oceanic district including New Zealand, New Guinea, Madagascar, and the intermediate islands. This was remarkably illustrated in the family of swans, of which its numerous representatives in the northern hemisphere are all perfectly white, whilst in the southern hemisphere there are only three species, of which one, that of New Holland, is perfectly black, and of the two others, natives of South America, one has a few black feathers and the other a black head and neck, the rest of the body being white ('Comptes Rendus,' Dec. 29, 1873). This peculiarity has also been shown by Mr. J. A. Allen to exist in the North American birds (Proc. Bost. Soc. Nat. Hist. vol. xv. p. 212), and also—and by the same naturalist—to be found in the North American squirrels (Paper read before U.S. Soc. Nat. Hist. Boston, Feb. 4, 1874). †

decided contrast to the allied species. A few examples will suffice. In the genus *Euplœa* of the subfam. *Danainæ*, in which the prevailing colour is generally some shade of black or brown, we see this resplendent blue coloration seeking to establish itself, as in the *Midamus* group, and reaching its full splendour in *E. dioeletia*, Hübn., a species found in the Philippine Islands. Amongst the *Satyrinæ* of generally sombre hue we again find this colour manifesting itself in such dull coloured genera as *Lethe*, where the *L. scanda*, Moore, a Sikkim species, is in striking contrast to its specific allies; in the genus *Cœlites* this blue coloration assumes a more dominant form, but reaches its maximum in *Ptychandra lorquinii*, Feld., another Philippine species.\* In the *Nymphalidæ* (referring only to this fauna) we have already seen it as a special element in the *Morphina*, and in the *Nymphalina*, *Eurytela castelnaui*, Feld., is a striking example. The eastern *Erycinidæ* show little approach to this hue, but still in the subfam. *Libytheinæ* we find again another and excellent illustration of the recurrence in *Libythea antipoda*, Boisd., a species found both in Celebes and the Philippine Islands. The *Papilionidæ* prove no exception. In the subfam. *Pierinæ*, in which white and yellow hues predominate, this same phenomenal coloration appears in *Appias celestina*, Boisd., a Papuan species, whilst in the *Papilioninæ* the most resplendent bluish coloration is exhibited in *P. ulyssees*, Linn., and some other allied species, likewise found in the Papuan region. These examples are taken solely from the Oriental and Papuan regions, and could be considerably augmented by increasing the area of examination. It is such isolated instances, and such concurrent facts, that promote research, and must be understood before we can arrive at any adequate explanation of the gorgeous and diverse coloration of butterflies.

The last remark, and one not the least important, is that though the late Mr. Hewitson was a considerable collector of these butterflies, and has left behind him some beautifully illustrated results of his study and regard, the figures in these works, which were drawn by himself, and represent in many cases the types of his own species, will *very often be found to disagree with the figures of the same species given in this publication*. The figures have been, however, carefully compared with his types, and the only explanation feasible is, either that his figures are not sufficiently exact, or, as I have had reason to believe, in substituting fresh and perfect specimens for his own cabinet, he has been known to have discarded a faded type, and replaced it by a well-conditioned specimen of an allied but distinct species.

### 1. *Narathura centaurus*. (Tab. XXI., figs. 4 ♂, 5 ♀.)

*Papilio centaurus*, Fabricius, Syst. Ent. p. 520, n. 329 (1775); Sp. Ins. p. 117, n. 523 (1781); Mant. Ins. p. 68, n. 646 (1787); Ent. Syst. iii. p. 275, n. 63 (1793).

*Amblypodia nakula*, Feld. Wien. Ent. Mon. iv. p. 395, n. 4 (1860); Druce, Proc. Zool. Soc. 1873, p. 353, n. 1; Kheil, Rhop. der Insel. Nias, p. 33, n. 121 (1884).

*Arhopala nakula*, Feld. Reise Nov. Lep. ii. p. 222, n. 244, t. 29, f. 14 (1865); Moore, Proc. Zool. Soc. 1878, p. 835; Wood-Mas. & de Nic. J. A. S. Beng. vol. L. p. 251, n. 77 (1881).

*Amblypodia centaurus*, Butl. Cat. Fabr. Lep. p. 179, n. 1 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 1 (1877); Druce, Proc. Zool. Soc. 1874, p. 107, n. 1.

\* The occurrence of these two bright blue butterflies in the Philippines, belonging to both the *Danainæ* and *Satyrinæ*, recalls the several similar instances found in insular faunas, given by Mr. Wallace in illustrating his thesis ("On some Relations of Living Things to their Environment," Pres. Address, Sect. Biology, Brit. Ass. Glasgow, 1876).

Male. Wings above dark violaceous-blue, the fringe brownish. Wings beneath ochraceous-brown. Anterior wings with two looped spots, margined with pale bluish in cell and a subquadrate spot, inwardly margined with pale bluish and outwardly with greyish at end of cell, a waved fascia margined with greyish crossing wing beyond cell, and the following spots margined with greyish:—one near costa above end of cell, and two beneath cell divided by the lower median nervule; the apical third of wing is somewhat paler, and contains a marginal and submarginal dark fascia. Posterior wings with the following spots and fasciæ margined with greyish:—seven basal spots, a central transverse fascia, which is connected above at the lower subcostal nervule with a broken macular fascia extending to abdominal margin; a marginal and two submarginal somewhat obscure fasciæ; three transverse marginal metallic greenish spots near anal angle. Body and legs more or less concolorous with wings.

Female. Wings above violaceous-blue, costal and outer margins of anterior wings broadly fuscous; posterior wings with the costal margin broadly, and the outer margin narrowly, fuscous. Wings beneath as in male.

Exp. wings, ♂, 50 to 58 millim.; ♀, 52 to 58 millim.

HAB.—Andaman Islands; Port Blair (Calc. Mus.).—Tenasserim; Taoo (Limborg—Moore).—Malay Peninsula; Penang (coll. Dist.); Province Wellesley (colls. Säuer and Dist.); Perak (Townsend—coll. Godm. & Salv.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Biggs—coll. Dist.; Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.).—Siam; Chentaboon, Nabconchaisee (Druce).—Sumatra (Brit. Mus.).—Nias Island (Kheil).—Borneo (Druce).

This is the true *Papilio centaurus*, Fabr., of which I have satisfied myself by a comparison with the Fabrician type contained in the Banksian collection in the British Museum. Considerable confusion exists as to the true identity of this species, and this has been greatly due and is still frequently caused by the erroneous representations of the species given by the late Mr. Hewitson,\* which seem to apply to a variety or distinct species found in Continental India. It is probably these figures which have induced many to consider as distinct the Malay butterfly described by Felder under the name of *Amblypodia nakula*. Mr. Kirby, in his Catalogue,† placed the two species as synonymous with one another; and, to render the matter as complicated as possible, N. M. Kheil has recently pointed out that Mr. Kirby is wrong, and uses Felder's name as distinct from the Fabrician. Mr. Butler, in 1869,‡ corrected this error, but his remarks appear to have been overlooked.

This is an abundant Lycænid in the Malay Peninsula, and its distribution extends through Tenasserim into Burma, but, owing to the confusion as to identity, its *known* geographical area is somewhat difficult to ascertain.

## 2. *Narathura agnis*. (Tab. XXI., fig. 29 ♀.)

*Arhopala agnis*, Felder, Reise Nov. Lep. ii. p. 228, n. 252 (1865).

Female. Wings above violaceous-blue; costal and outer margins of both wings broadly fuscous. Wings beneath pale brownish, with the following spots and fasciæ margined with greyish:—anterior wings with two spots in cell and one at end of cell, two spots beneath cell divided by the lower median nervule, a somewhat curved macular fascia between end of cell and outer margin commencing near costa and terminating at lower median nervule, and a more obscure submarginal fascia; posterior wings with about seven basal spots, a subquadrate spot at end of cell continued as a macular fascia to abdominal margin, an outer discal macular fascia which becomes duplex near anal angle, and a somewhat obscure submarginal

\* Cat. Lyc. Brit. Mus. t. 2, f. 10—13 (1862).

† Syn. Cat. Diurn. Lep. p. 419-20.

‡ Cat. Fabr. Lep. p. 179.

fascia; three transverse, marginal, metallic greenish streaks, the innermost with a black spot near anal angle (*two of these are rubbed or obliterated in the specimen figured*); tail-like appendages with their apices greyish-white. Body above more or less concolorous with wings, beneath more or less greyish; legs pale brownish.

Exp. wings, ♀, 60 millim.

HAB.—Malay Peninsula; Malacca (Com. de Castelnau—coll. Feld.; coll. Dist. and Brit. Mus.); Perak (Künstler—Calc. Mus.).

Since writing the above I have been enabled to examine a male specimen of this species, and find it is unicolorous and dark violaceous-blue above, and exactly resembling the female beneath. It is evidently a much rarer insect than *N. centaurus*, or at least more seldom met with by collectors. Mr. Kirby has placed *N. agnis* as a synonym of the Sumatran species, *N. anarte*, Hew., but it is sufficiently distinct for specific separation.

### 3. *Narathura anthelus*. (Tab. XXIII., fig. 4 ♀.)

*Amblypodia anthelus*, Doubleday & Hewitson, Gen. Diurn. Lep. t. 74, f. 6 (1852); Hewits. Cat. Lyc. Brit. Mus. t. 3, f. 23, 24 (1862); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 3 (1877).

*Satadra anthelus*, Moore, J.A.S. Beng. vol. liii. pt. ii. no. 1, p. 24 (1884).

Female. Wings violaceous-blue; anterior wings with the costal margin, apex, and outer margin broadly fuscous, the fuscous coloration also continued in a disco-cellular streak at end of cell; posterior wings with the costal margin broadly and the posterior margin more narrowly fuscous; apices of the tail-like appendages greyish-white. Wings beneath pale brownish, with the following dark purplish or pale brown spots and fasciæ margined with greyish; anterior wings with two looped spots in cell and a subquadrate spot at end of cell, a fractured macular fascia between end of cell and outer margin, which is strongly dislocated at upper median nervule; between this fascia and base are a series of large irregular costal spots, a small spot beneath cell between the bases of the second and third median nervules, and a more obscure and narrow, macular, submarginal fascia; posterior wings with an irregular series of five subcostal spots, beneath which are four smaller basal spots, a very irregular discal fascia extending from lower subcostal nervule to abdominal margin, and an outer pale, waved fascia extending from the outer subcostal spot to abdominal margin; three transverse metallic greenish spots more or less shaded with black near anal angle, where the outer margin is narrowly greyish. Body above and beneath, with legs, more or less concolorous with wings.

Male. I have not seen this sex, but, as figured by Doubleday and Hewitson, it is violaceous-blue above, with the costal and outer margins narrowly dark fuscous, somewhat more broadly so at the apices of both wings and at the anal angle of the posterior wings.

Exp. wings, ♀, 55 millim.

HAB.—Burma; Moulmein (Doub. & Hew.).—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.).

### 4. *Narathura maxwelli*, n. sp.\* (Tab. XXIII., fig. 10 ♀.)

Female. Wings above violaceous-blue; anterior wings with the costal and outer margins (abruptly widened at apex) dark fuscous; posterior wings with the costal and outer margins dark fuscous; abdominal margin fuscous, tail-like appendages with their apices greyish-white. Wings beneath brownish, with the following spots and fasciæ margined with greyish:—two in, and one at end of cell; above this

\* Named after Mr. W. E. Maxwell, not only well known as the "Resident" at Larut, but also as the author of 'A Manual of the Malay Language,' &c.

last is a small and obscure spot; a curved macular fascia between end of cell and outer margin, commencing near costa, abruptly dislocated at upper median nervule, from which it is continued by three fused spots, the uppermost smallest, two spots beneath cell divided by the lower median nervule, and a submarginal waved fascia; posterior wings with seven basal spots, two transverse, waved, discal fasciæ dislocated and fused from lower subcostal nervule to costal nervule, a waved submarginal fascia as on anterior wings, and three metallic greenish spots, more or less shaded with black near anal angle; body above and beneath, with legs, more or less concolorous with wings.

Exp. wings, 50 millim.

HAB.—Malay Peninsula; Malacca (Biggs—coll. Dist.).

One female specimen collected by the Rev. L. Biggs is at present my only knowledge of this species. It appears, however, quite distinct from anything described, and is an interesting addition to this large genus.

5. *Narathura farquhari*,\* n. sp. (Tab. XXIII., fig. 3 ♂.)

*Amblypodia eumolphus*, Butler (nec Cram.), Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 2 (1877).

Male. Wings above bright golden-green; anterior wings with the costal margin narrowly, and the outer margin more broadly, dark fuscous; posterior wings with the costal, posterior and abdominal margins dark fuscous, the posterior widest and continued in rays along the median nervules; apices of the tail-like appendages greyish-white. Wings beneath brownish, with the following spots and fasciæ margined with greyish:—anterior wings with two spots in cell, one transverse at end of cell reaching the third subcostal nervule, a small spot between bases of second and third subcostal nervules, two spots beneath cell divided by the lower median nervule, a macular fascia between end of cell and outer margin, strongly dislocated at the upper median nervule, a submarginal and a more obscure marginal fascia; posterior wings with seven basal spots, two central, transverse macular fascia dislocated and united into one from the lower subcostal nervule to the costal nervule, marginal and submarginal fasciæ as on anterior wings, but more obscure, and three transverse metallic greenish spots, more or less marked with black, near anal angle. Body above and beneath, including legs, more or less concolorous with wings.

Exp. wings, ♂, 54 to 58 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.); Singapore (Kerr, Biggs—coll. Dist.; coll. Godfery).

I have not seen the female of this species. Horsfield has given † a description of that sex belonging to the Javan species (under the name of *A. eumolphus*) which may or may not be conspecific, but is certainly very closely allied to *N. farquhari*. According to that description the female is black above, “the greenish golden lustre being limited in the fore-wings to a medial patch extending to the base, and in the hinder to a triangular spot occupying the basal areolet.”

This species has hitherto been confounded with the *N. eumolphus* of Cramer, but a reference to that author's figure will at once dispel any ground of misunderstanding, it having the outer discal transverse fascia to the anterior wings straight and not strongly dislocated as in this species. Cramer also gives the “Coast of Bengal” as its habitat.

\* Named after Colonel Farquhar, whilom Governor of Malacca, whose worth may be estimated by the tribute paid to his memory by the native writer, Abdulla bin Abdul Kadar, munshi. This no mean authority, in addition to much other favourable testimony, states, “All the four races (Malays, Chinese, Klings, and Portuguese) in Malacca were exceedingly fond of, and attached to, the Governorship of Major Farquhar” (‘Translations from the Hakayit Abdulla,’ by J. T. Thomson, p. 27). Can Proconsul achieve much more?

† Cat. Lep. E. I. C. p. 104.

6. *Narathura adatha*. (Tab. XXIII., fig. 1 ♂, 2 ♀.)

*Amblypodia Adatha*, Hewitson, Cat. Lye. Brit. Mus. t. 4, f. 29—31 (1862); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 4 (1877).

Before describing this species it is necessary to make two preliminary observations. Firstly: the figures here given are those of a male and female specimen captured in Malacca by Capt. Pinwill, and now contained in the British Museum; and secondly: these figures do not altogether correspond to those given by Mr. Hewitson as representative of his species. I have, however, carefully compared them with the *type specimen* of Hewitson, and find that they are correct and faithful. Mr. Hewitson also obscured the identity of his *A. adatha* by firstly placing it as a synonym of the "*Arhopala micale*" of Boisduval,\* and subsequently as distinct from *A. micale*, but conspecific with the Amboinese *Amblypodia cleander*, Feld. †

Male. Wings above dark violaceous-blue; † apices of the tail-like appendages to the posterior wings greyish-white. Wings beneath brownish, with the following spots and fasciæ margined with greyish; anterior wings with two spots in, and one at end of cell, two spots beneath cell divided by the third median nervule, a curved fascia (dislocated at the upper median nervule) between cell and outer margin and a narrower submarginal fascia; posterior wings with seven basal spots, a transverse central fascia commencing at costal nervule and terminating near base of upper median nervule, followed by a transverse fascia commencing at lower subcostal nervule, a submarginal fascia and three marginal transverse metallic greenish spots, more or less spotted with black, near anal angle. Body above and beneath more or less concolorous with wings.

Female. Resembling the male, but with broad darker margins to the upper surface of the wings.

Exp. wings, ♂ and ♀, 40 to 42 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (Kerr—coll. Dist.).

7. *Narathura atosia*. (Tab. XXIII., figs. 6 ♂, 5 ♀.)

*Amblypodia atosia*, Hewitson, Ill. Diurn. Lep. p. 9, n. 37, t. 2, f. 8, 9 (1863); Druce, Proc. Zool. Soc. 1873, p. 353, n. 4; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 5 (1877).

The figures of this species, here given, are taken from two Malaccan specimens in the British Museum. As I have not received the species, I append a copy of Mr. Hewitson's description:—

"Upperside. *Male*.—Lilac-blue; the margins black, very narrow. Anterior wing with a large central spot of somewhat different colour, not seen except in a certain light, and not produced by any unusual arrangement of the scales."

"Underside rufous-brown. Anterior wing, with the transverse band broken, composed of seven parts; three together, the fourth projecting outwardly from the rest, the three following further from the margin than the fourth."

\* Cat. Lye. Brit. Mus. p. 7 (1862).

† Ill. Diurn. Lep. p. 8, n. 28 (1863).

‡ A specimen received from Singapore has the colour above darker blue and less violaceous than in the figures here given, which are taken from Malaccan specimens in the British Museum.

"*Female*.—Violet-blue. Anterior wing with the costal margin, the apex, and the outer margin broadly black, the nervures black. Posterior wing with the apex and outer margin broadly dark brown, the nervures black."

"Exp.  $1\frac{1}{10}$  inch."

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Sumatra (coll. Hewits.).—Borneo (Druce).

8. *Narathura antimuta*. (Tab. XXIII., fig. 11 ♀.)

*Arhopala antimuta*, Felder, Reise Nov. Lep. ii. p. 233, n. 260 (1865).

*Amblypodiv antimuta*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 8 (1877).

The Malaccan specimen here figured has been identified and recorded by Mr. Butler as Felder's species. The following is a copy of the original description:—

"♂. Alæ supra obscure violaceo-cyaneæ, margine externo perangusto fusco, subtus omnes dilute fuscæ, anticæ intus pallidiores, maculis duabus annularibus in cellula, tertia infra venam medianam, fasciola discocellulari, fascia exteriori abbreviata catenulari fracta alteraque maculari submarginali fundo paullo saturatoribus, multo dilutius cinctis, posticæ macula in costæ lobulo, tribus basalibus, quarta interna, quinta subcostali, sexta majore cellulari annularibus, septima infra hanc, vix cordata, fasciola discocellulari fasciaque externa a margine bene distante macularum subtriangularium fundo saturatoribus, multo dilutius cinctis, fascia pone medium, catenulata, apud ramum medianum primum valde fracta et per striolam cum fasciola juncta, postice sursum flexa, fundo paullo saturatiore (maculis duabus supremis ejus plane separatis, annularibus), maculis duabus analibus nigris, metallico-cyaneo introrsum limitatis et maculis totidem obsoletis nigris, atomis albidis intus cinctis insedentibus."

HAB.—Malay Peninsula; Malacca (Com. de Castelnau—coll. Feld.; Pinwill—Brit. Mus.).

9. *Narathura aroa*. (Tab. XXIII., fig. 17.)

*Amblypodia Aroa*, Hewitson, Ill. Diurn. Lep. p. 13, n. 60, t. 2, f. 12 (1863); Butl. Trans. Linn. Soc. ser. 2,

Zool. vol. i. p. 548, n. 9 (1877).

This is another species not yet obtained by the writer from the Malay Peninsula. The specimen figured was collected by Capt. Pinwill in Malacca, and I append the description as given by Mr. Hewitson:—

"Upperside. *Male*.—Violet-blue: the margins *very narrow*, black."

"Underside rufous-brown. Anterior wing with the band of nearly equal breadth, slightly curved."

Exp.  $1\frac{1}{10}$  inch.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Sumatra (coll. Wallace—Hewits.).

Mr. Hewitson also remarks, "*A. Aroa* is very nearly allied to *A. Hypomuta*;\* the blue of its upperside is less brilliant, and the spots and bands of the underside appear to be much wider apart. *A. Hypomuta* seems, on the posterior wing, as if covered throughout with spots, the spaces between the bands and spots having nearly the same appearance as the usual spots and bands themselves have."

\* A species described on the following page under the earlier name of *N. amphimuta*.



10. *Narathura metamuta*.\* (Tab. XXIII., figs. 19, 18 var.?)

*Amblypodia metamuta*, Hewitson, Ill. Diurn. Lep. p. 13, n. 59, t. 2, f. 14, 15 (1863); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 10 (1877).

This is another of the many species captured in Malacca by Capt. Pinwill that have apparently been met with by no other collector. The figure represents two such specimens now contained in the British Museum. Fig. 19 is typical; fig. 18 represents a specimen catalogued as Hewitson's species by Mr. Butler, and which may probably be but a variety, and is figured as such? The original description is as follows:—

“Underside. *Male*.—Anterior wing violet-blue: posterior wing brilliant morpho-blue; the *margins broad*, dark brown.”

“Underside. Anterior wing with the *first three spots* of the transverse band *placed obliquely outwards*, the *two outer spots* a little within them and *placed transversely*.”

“Exp.  $1\frac{1}{2}$  inch.”

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Sumatra (coll. Wallace—Hewits.).

The different colour of the anterior and posterior wings readily indicates the identity of this species, and, as remarked before, the so-called variety here figured, is only admitted as such with hesitation, until a series of specimens can be examined.

11. *Narathura amphimuta*. (Tab. XXI., fig. 10 ♂, and 9 ♀.)

*Amblypodia Amphimuta*, Felder, Wien. Ent. Mon. iv. p. 396, n. 6 (1860); Butl., Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 548, n. 6 (1877).

*Arhopala Amphimuta*, Feld. Reise Nov. Lep. ii. p. 232, n. 259, t. 29, f. 8 (1865).

*Amblypodia Hypomuta*, Hewits. Cat. Lye. Brit. Mus. p. 11, n. 52, t. 6, f. 63, 64 (1862); Ill. Diurn. Lep. p. 12, n. 58, t. 2, f. 13 (1863); Druce, Proc. Zool. Soc. 1873, p. 354, n. 11; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 11 (1877).

*Male*. Wings above violaceous-blue, margins narrowly dark fuscous; wings beneath brownish with the following spots and fasciæ margined with greyish; anterior wings with two spots in, and one at end of cell, two beneath cell divided by the lower median nervule, a slightly curved fascia between end of cell and outer margin, which is strongly dislocated between the lower discoidal and upper median nervules (where it has the appearance of a projecting spot),† a subcostal spot between the first and second subcostal nervules and a narrow submarginal fascia; posterior wings with six basal spots, two irregular central curved macular fasciæ, dislocated and united into one from lower subcostal nervule to costal nervule, a submarginal fascia and three marginal metallic greenish spots more or less marked with black near anal angle: apices of tail-like appendages greyish-white. Body above and beneath with legs more or less concolorous with wings.

*Female*. Paler bluish above, the dark marginal shadings very broad on anterior wings at apex and outer margin, and at apex of posterior wings; wings beneath as in male.

Exp. wings, ♂ and ♀, 32 to 45 millim.

\* In the specific nomenclature of this genus several authors appear to have not only recognised the difficulty of properly separating the species, but to have also endeavoured to make it almost impossible to remember the names of such species, by inventing a farrago of euphonious words, as though rhyme was the one thing needful. To this rhythmical and labyrinthian effect the following contributions may be acknowledged:—‘*muta*,’ ‘*epimuta*,’ ‘*amphimuta*,’ ‘*antimuta*,’ ‘*hypomuta*,’ ‘*metamuta*,’ and ‘*perimuta*.’ As these are all names of closely allied species, such “contributions to science” require application and study.

† This has not been sufficiently shown in the figure of the female here given, though it is distinctly indicated in that of the male.

HAB.—Malay Peninsula: Penang, Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.; colls. Moore and Godm. & Salv.); Singapore (Kerr—coll. Dist.).—Borneo (Druce).

This species varies greatly in size, the smallest specimen examined being a female and expanding only 32 millim. As Mr. Hewitson pointed out, an excellent differential specific character is found in the spot-like projection to the discal fascia on the under surface of the anterior wings; but when the describer states that in the female the last spot of this fascia also projects outwardly, he has described what is found on none of the specimens now before me.

Mr. Hewitson recognised the identity of his *A. hypomuta* with the *A. amphimuta*, Feld.,\* and though Mr. Butler states† that the two are quite distinct, and places them wide apart, I have failed to find these differences. A closely allied species, *A. epimuta*, Moore, was included by Mr. Butler in his catalogue of Malaccan butterflies,‡ but could not be found in the National Collection, for the use of our artist, and so it is not included here.

## 12. *Narathura kurzi*, § n. sp. (Tab. XXI., fig. 1 ♂.)

Male. Wings above dark violaceous-blue. Wings beneath brownish, with the following spots and fasciæ margined with greyish:—anterior wings with two spots in and one at end of cell; two beneath cell divided by the lower median nervule; a macular fascia beyond cell, which is strongly dislocated at upper median nervule and is then inwardly continued by an almost separated spot terminating near the central median nervule; posterior wings with about six basal spots (*the extreme basal spots have been omitted in the figure*), a central discal fascia commencing at lower subcostal nervule, followed by a fascia crossing the whole breadth of wing, a submarginal fascia, and marginal metallic greenish spots, more or less marked with blackish near anal angle. Body above and beneath, with legs, more or less concolorous with wings.

Exp. wings, ♂ 42 millim.

HAB.—Malay Peninsula; Malacca (coll. Dist.).

Only one male specimen of this distinctly marked species is known to the describer, and the female has still to be discovered.

## 13. *Narathura ameria*. (Tab. XXI., fig. 30 ♀.)

*Amblypodia ameria*, Hewitson, Cat. Lyc. Brit. Mus. p. 14, n. 64, t. 8, f. 85, 86 || (1862).

Female. Wings above dark violaceous-blue, costal and outer margins of both wings, and abdominal margin of posterior wings broadly dark fuscous. Anterior wings beneath somewhat rufous-brown, cell containing a whitish line near base, two near centre, and two at termination, some obscure whitish linear marks above the cell; beneath the cell the colour is paler, containing a conical brownish spot between the second and third median nervules and a broad brown spot between the third median nervule and

\* Ill. Dirn. Lep. p. 12, n. 58.

† Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549.

‡ Ib. p. 548, n. 7.

§ Dedicated to the memory of the late excellent botanist, Sulhiz Kurz, author of the 'Forest Flora of British Burma,' &c. He died at Penang on his way to the islands of the Malayan Archipelago, for the purpose of botanical exploration.

| The figure of the underside of this species as given by Hewitson is totally unlike that which I have given here. I have, however, carefully compared my figure and specimen with the *type specimen* of Hewitson's species in the British Museum, and they are altogether identical. Hewitson's figures of the undersides of these *Amblypodia* are frequently altogether misleading.

the submedian nervure, a curved transverse fascia bordered with greyish between end of cell and outer margin dislocated at the upper discoidal and median nervules, and with a submarginal row of lunulate spots bordered with greyish. Posterior wings beneath brownish with a steely tinge, the basal third with reticulated dark brown fasciæ, followed by a transverse, discal, angulated fascia of the same colour, and with a submarginal series of dark brown spots. Body above and beneath with legs more or less concolorous with wings.

Exp. wings, ♀, 44 millim.

HAB.—Continental India; N. India (*sic*) (coll. Hewits.).—Malay Peninsula; Perak (Townsend—coll. Godm. & Salv.).—Siam (coll. Hewits.).

A female specimen, captured by Dr. Townsend in Perak, is here figured, and is the only example of the species from the Peninsula of which I have, at present, information.

#### 14. *Narathura anniella*. (Tab. XXI., fig. 20 ♂.)

*Amblypodia anniella*, Hewitson, Cat. Lyc. Brit. Mus. p. 10, n. 46, t. 8, f. 83, 84 (1862).\*

Male. Wings above dark violaceous-blue; costal and outer margins narrowly darker. Anterior wings beneath pale castaneous with an ochraceous tinge, and with the following dark castaneous spots and fasciæ narrowly margined with greyish:—a spot crossing cell near centre (the basal portion of cell is also dark castaneous), a short broad fascia at end of cell joined to a spot beneath cell and terminating at lower median nervule: this is followed at a short distance by another fascia commencing nearer costa and terminating in a spot between the second and third median nervules, and an outer marginal fascia, becoming obsolete towards outer angle; between these fasciæ, but particularly at apex of wing, there is a strongly developed steely-blue tinge. Posterior wings beneath dark castaneous, with the following spots and fasciæ margined with steely-blue lines; a looped costal spot near base and terminating near subcostal nervure: this is connected with three discal fasciæ, which are also more or less fused at the extreme margins, and the uppermost of which is dislocated at the median nervure, and the lowermost is narrowest and strongly tinged on each side on lower half of wing with steely blue; a small black marginal spot with some metallic greenish scales between the second and third median nervules, and another near anal angle. Body above and beneath, with legs, more or less concolorous with wings.

Female. Wings above paler in hue than those of the male, and with the margins (especially at apex of anterior wings) broadly dark fuscous. Wings beneath as in male.

Exp. wings, ♂ and ♀, 40 to 44 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (coll. Godfy.); Sungei Ujong (Durnford—coll. Dist.).—Singapore (coll. Hewits.).

#### 15. *Narathura lycænaria*.

*Amblypodia lycænaria*, Felder, Wien. Ent. Mon. iv. p. 396, n. 9 (1860); Hew. Cat. Lyc. Brit. Mus. p. 12, n. 54 (1862); Druce, Proc. Zool. Soc. 1873, p. 354, n. 12.

*Arhopala lycænaria*, Feld. Reise Nov. Lep. ii. p. 232, n. 258, t. 29, f. 13 (1865).

\* These figures do not at all agree with the one here given, and I could not have believed that I possessed the species had I not carefully compared my specimens with Hewitson's type. There can be no doubt that in the Eastern *Lycanida* Hewitson's figures are, in several cases, in direct antithesis to his typical specimens, which being now contained in the National Collection, must be accepted as decisive.

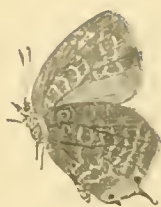


FIG. 79.—*Narathura lycænaría*.

The woodcut here given is copied from Felder's figure, and which when executed, constituted the writer's sole knowledge of the species. Since then a specimen has been received which affords an opportunity of giving a fuller description.

Male. Wings above bright shining cerulean-blue; costal and outer margins narrowly fuscous. Wings beneath brownish, with the following greyish lines or fasciæ and spots:—anterior wings with two pairs of transverse lines in cell (one at base and one near middle), and a similar pair at end of cell; above the last are two placed closer together, and almost reaching costa; a pair beneath cell situate on each side of lower median nervule; between cell and outer margin is a curved fascia, strongly dislocated at the nervules, commencing at second subcostal nervule and terminating at lower median nervule, and a submarginal row of small greyish spots placed between the nervules; posterior wings with two basal spots, and the whole disk covered with transverse fasciæ more or less dislocated and fused; three black spots with metallic greenish scales near anal angle. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 38 millim.

HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.); Malacca (Com. de Castelnau—coll. Feld.); Singapore (Wallace).—Borneo (Druce).

I have not seen a female specimen, but in the male sex the species is rendered very distinct from any of those preceding and here enumerated, by the *metallic* cerulean-blue of the upper surface of the wings. As it is now recorded from Penang, Malacca, and Singapore, *N. lycænaría* is probably generally distributed throughout our area.

The following species are only known to the writer by figures and descriptions (both of which are here reproduced), and seem to belong to the genus *Narathura*:—

#### 16. *Narathura vihara*.



FIG. 80.—*Narathura vihara*.\*

*Amblypodia vihara*, Felder, Wien. Ent. Mon. iv. p. 395, n. 5 (1860); Kheil, Rhop. der Insel Nias, p. 33, n. 122 (1884).

*Arhopala vihara*, Feld. Reise Nov. Lep. ii. p. 228, n. 253, t. 29, f. 7 (1865).

Male. "Alæ supra saturate violaceo-cyanæ, anticæ margine costali et externo latiusculo nigro-fuscis, posticæ limbo costali in marginem posticum latiusculum incrementem transeunte limboque interno fuscis."

"Alæ subtus dilute fusæ, fascia submarginali communi, anticarum maculis binis annularibus fundo saturatoribus in cellula, macula discocellulari, duabus infra venam medianam fasciæque catenulari exteriori apud ramum medianum primum finita, apud tertium fracta, posticarum maculis quinque basalibus annularibus fundo saturatoribus, sexta interna, fasciola tripartita discoidali fasciæque exteriori catenulari apud ramum subcostalem secundum fracta, fasciolæ contigua, postice sursum flexa et continua

\* This figure is taken from the coloured copy of Felder's work. If an uncoloured copy is consulted, the spots on the under surface of the posterior wings appear to have a greater amount of specialisation.

fuscis, multo dilutius cinctis, anticæ trienté in terno pallido, posticæ maculis tribus analibus, incrementibus atris, media omnino—, reliquis introrsum metallice cyaneo atomatis.”

Female. “Alæ supra dilutiores, quam in mare, anticæ limbo costali sinuato et margine lato postico fuscis, posticæ limbo costali in limbum posticum transeunte ejusdem coloris, limbo interno pallidius fusco.”

“Alæ subtus omnino ut in mare.”

HAB.—Malay Peninsula; Malacca (Com. de Castelnau—coll. Feld.); Nias Island (Kheil).

Felder also appends the following remarks:—“Schon durch die viel dunklere, ziemlich breit gerandete Oberseite des Männchens von der vorbeschriebenen Species auffallend abweichend. Die Vorderflügel sind stumpfer und die Hinterflügel kürzer und am Scheitel mehr vorgezogen, als bei *A. Agnis*.”

### 17. *Narathura inornata*.

*Amblypodia inornata*, Felder, Wien. Ent. Mon. iv. p. 396, n. 6 (1860).

*Arhopala inornata*, Feld. Reise Nov. Lep. ii. p. 234, n. 261, t. 29, f. 12 (1865).

Male. “Alæ supra vivide saturate cyaneæ, margine ante cilia fusca, subtus dilutissime fuscæ, anticæ introrsum pallentes, maculis duabus annularibus cellulæ, tertia mediana, quarta interiore, quinta discocellulari fasciaque exteriori, curvata, catenulari fundo paullo saturatoribus, dilutius cinctis, vix conspicuis, fascia submarginali plane fere evanescente, posticæ maculis septem basalibus annularibus (exterioribus sat-magnis), fasciola discocellulari, fascia exteriori vix catenulari, apud ramum sub-costalem secundum et medianum primum valde fracta, postice sursum flexa alteraque submarginali, submaculari, decrescente, fundo paullo saturatoribus, multo dilutius cinctis, linea ante marginali diluta.”

Female. “Alæ supra multo dilutiores, anticæ margine costali fusco in limbum terminalem ad apicem sat latum, dein valde decrescentem, intus subarcuatum transeunte, posticæ limbo costali fusco, in marginem externum perangustum, angulum analem versus latiore abeunte, limbo interno, ut in mare, fusciscente.”

“Alæ subtus omnino ut in mare.”

HAB.—Malay Peninsula; “Malacca Interior” (Com. de Castelnau—coll. Feld.).

### 18. *Narathura achelous*.

*Amblypodia Achelous*, Hewitson, Cat. Lyc. Brit. Mus. p. 7, n. 30, t. 5, f. 47, 48 (1862); Druce, Proc. Zool. Soc. 1873, p. 354, n. 13.

“Upperside. *Male*.—Dark blue: the margins with a narrow border of brown.”

“Underside rufous-brown: the costal margins broadly lilac. The band of the anterior wing broken, formed of five spots, the middle spot projecting towards the outer margin. Posterior wing without a band: the apex with four black spots irrorated with golden-green.”

“*Female*.—Like the male, except that the blue of the upperside is lighter, with the margins broadly brown. The costal margins of the underside paler.”

HAB.—Malay Peninsula; “Singapore” (coll. Wallace—Hewits.).—Borneo (Druce).



FIG. 81.—*Narathura inornata*.



FIG. 82.—*Narathura achelous*.

19. *Narathura ammon*.

*Amblypodia Ammon*, Hewitson, Cat. Lyc. Brit. Mus. p. 9, n. 41, t. 5, f. 49, 50 (1832).



FIG. 83.—*Narathura ammon*.

“Upperside. *Male*.—Lilac-blue: the margins with a narrow border of black.”

“Underside rufous and lilac-grey. The band of the anterior wing broken, the middle spot projecting outwards. Posterior wing without a transverse band, with a white spot on the middle of the costal margin: the black spots at the anal angle irrorated with silvery-blue.”

“*Female*.—Like the male, except that the margins are much broader.”

HAB.—Malay Peninsula; “Singapore” (coll. Wallace—Hewits.).

## Genus PANCHALA.

*Panchala*, Moore, Proc. Zool. Soc. 1882, p. 251.

*Satadra*, Moore, J. A. S. Beng. vol. liii. pt. 2, no. 1, p. 23 (1884).

This genus is closely allied to *Narathura*, the only structural difference of any value which I can discover being in the length of the costal nervure of the anterior wings, which, as pointed out in the generic synopsis (*antea*, p. 234), extends to about half the distance of the costal margin.

I have felt no hesitation in placing *Satadra* as a synonymy of *Panchala*, Mr. Moore, its proposer and describer, stating that its “venation” is “similar to that of *Panchala*.”

It is, however, a question whether these four proposed genera, viz., *Narathura*, *Nilasera*, *Panchala*, and *Satadra*, as formulated by Mr. Moore, and condensed into two by the present writer, would not even be more naturally treated as one, under two sections. One feels a reticence in altogether disagreeing with the conclusions of a veteran lepidopterist, but at the same time how can this generic splitting advance the study of Entomology, which, after all, is the only excuse for publication?

The geographical distribution of *Panchala* has been noticed with that of *Narathura*.

a. *Posterior wings with a slender tail-like appendage at apex of lower median nervule, and a small rudimentary one at apices of second median nervule and submedian nervure.*

1. *Panchala diardi*. (Tab. XXIII., fig. 14 ♀.)

*Amblypodia Diardi*, Hewitson, Cat. Lyc. Brit. Mus. p. 9, n. 43, t. 5, f. 41, 42 (1862); Druce, Proc. Zool. Soc. 1874, p. 107, n. 2.

*Amblypodia? Diardi*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 13 (1877).

*Satadra diardi*, Moore, J. A. S. Beng. vol. liii. pt. ii. no. 1, p. 26 (1884).

*Female*. Wings above dark violaceous-blue; anterior wings with the costal and outer margins broadly (especially at the apex) dark fuscous; posterior wings with the costal and posterior margins fuscous; tail-like appendages with their apices greyish-white. Wings beneath violaceous-brown, with the following dark purplish-brown markings and fasciæ margined with greyish:—anterior wings with the basal half of costal area (somewhat paler), basal half of cell (somewhat excavated internally), a broad

curved and angulated fascia commencing at end of brown costal area and terminating at lower median nervule, followed by a more regularly curved fascia extending from costa to lower median nervule, and a narrow marginal and submarginal fascia fused together near apex; posterior wings with a basal costal spot, followed by eight very irregularly sized spots (some more or less fused and one long and fascia-like extending from costa to base of upper median nervule) on discal half, again followed by an outer dislocated narrow fascia, which is merged in a purplish-brown patch near apex, a faint lunulate marginal fascia including some very small spots, and three large marginal spots of metallic greenish scales near anal angle, the first and third of which contain a black spot. Body above and beneath more or less concolorous with wings; legs concolorous, the tarsi greyish.

Exp. wings, ♀, 42 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Singapore (coll. Godfrey); Siam; Nabonchaisee (Druce).

The male, as figured by Hewitson, is unicolorous, violaceous-blue above.

## 2. *Panchala singhapura*, n. sp.

Male. Wings above dark violaceous-blue, the fringe dark fuscous. Wings beneath violaceous-brown, with the following dark purplish-brown markings and fasciæ:—anterior wings marked as in *P. diardi*; posterior wings with a basal costal spot, a broad transverse fascia crossing wing at basal third, followed by a central fasciate spot extending from costal nervule to base of third median nervule, where it is connected with an upper spot situate between the median and the submedian nervures; other markings as in *P. diardi*, save that the anal angular greenish marginal spots are situate in a broad dark purplish-brown patch.

The ground colour of the under surface of the posterior wings is much more violaceous than that of the anterior wings.

Female.—Wings above much paler violaceous-blue than in male; anterior wings with the costal and outer margins (broadest at apex and extending to upper disco-cellular nervules) broadly dark fuscous; posterior wings with the costal, outer and abdominal margins dark fuscous. Wings beneath as in male.

Exp. wings, ♂ and ♀, 40 to 42 millim.

HAB.—Malay Peninsula; Singapore (Kerr and Biggs—coll. Dist.).

This species is closely related to *P. diardi*, as may be seen by comparing the figures here given, the specific differences being most emphatically illustrated by the distinct markings on the under surface of the posterior wings. It is also *very* closely allied to the Philippine species, *P. fulgida*, Hew., from which it is most readily discriminated by the much larger bluish area on the upper surface of the wings in the *female* sex.

## 3. *Panchala apidanus*.

*Papilio Apidanus*, Cramer, Pap. Ex. ii. t. 137, F, G (1779).

*Papilio Dorimond*, Stoll, Suppl. Cram. t. 27, f. 4, 4 D (1790).

*Polygonmatus Apidanus*, Godt. Enc. Méth. ix. p. 652, n. 118 (1823).

*Amblypodea apidanus*, Horsf. Cat. Lep. E. I. C. p. 100, n. 32 (1829);

Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 39, n. 53 (1857);

Snell. Tijds. Ent. xix. p. 16, n. 54 (1876); Butl. Trans. Linn. Soc.

ser. 2, Zool. vol. i. p. 549, n. 12 (1877).

*Amblypodia Aphidanus*, Druce, Proc. Zool. Soc. 1873, p. 353, n. 7.

*Satadra apidanus*, Moore, J. A. S. Beng. vol. liii. pt. 2, no. 1, p. 26 (1884).

FEBRUARY 20, 1885.



FIG. 84.—*Panchala singhapura* ♀.



FIG. 85.—*Panchala apidanus* ♂, showing mutilation effected by the attack of a bird.

Male. Wings above dark violaceous-blue, the outer margins narrowly fuscous. Wings beneath pale violaceous-brown, with the following dark chocolate-brown markings and fasciæ margined with obscure greyish:—anterior wings with a basal patch occupying more than third of wing, to which is attached a curved fascia crossing end of cell and terminating at lower median nervule, beneath which is a rounded spot, followed by an outer curved fascia terminating a little before the lower median nervule, and an obscure submarginal fascia; posterior wings with a patch occupying about basal third, and outwardly waved; a central narrow much-waved fascia preceded by a spot between the third median nervule and the submedian nervule, an outer wider irregular fascia, a faint submarginal scalloped fascia, and with the usual greenish scales near anal angle, containing a large black spot at the extreme angle. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 44 millim.

HAB.—Burma; Moulmein (Brit. Mus.).—Malay Peninsula; Malacca (Pinwill—Brit. Mus.); Singapore (coll. Godfery).—Sumatra (Moore).—Java (Horsf.); Batavia (Snellen).—Borneo (Druce).

The late Dr. Horsfield remarked that this butterfly in Java appeared to be a most abundant species compared with its allies. Strange to say, I did not meet with it myself when collecting in Province Wellesley, and have seen it in none of the large collections since received or examined from different parts of the Peninsula, excepting a specimen contained in the collection of Mr. Godfery, who labels it “rare kind.” It is therefore not common in this fauna. The specimen figured is one certified by Mr. Godfery to have been mutilated by a bird, and I have figured it in this condition.

According to Dr. Horsfield, as observed in Java, “the larva feeds on the leaves of several species of *Eugenia* and *Calyptranthes*.”\*

#### 4. *Panchala morphina*.



FIG. 86.—*Panchala morphina* ♂.†

*Panchala morphina*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xiv. p. 201 (1884).

Male. Wings above dark shining purplish-blue, the margins (narrowly), nervures, and nervules more or less blackish; abdominal area of the posterior wings fuscous. Wings beneath pale brownish: anterior wings with the basal area from costa to median nervure, and extending outwardly to a little beyond cell, darker brown, followed by a waved fascia of the same colour, terminating beneath second median nervule, where it is narrowest; the outer margin also darker brown, with the apex and extreme margin pale violaceous. Posterior wings with the basal fourth dark chocolate-brown, with a narrow outer violaceous margin; a small chocolate-brown spot margined with violaceous above the submedian nervule, a narrow waved central violet-margined fascia crossing disk, strongly fractured at end of cell, and then more narrowly continued to internal nervule; this is followed by a short and somewhat broken fascia, commencing at lower subcostal nervule and narrowly terminating at lower median nervule, the whole outer margin broadly infuscated, the apex and extreme margin pale violaceous. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 51 millim.

HAB.—Malay Peninsula; Perak (Künstler—Calcutta Mus.).

\* Cat. Lep. E. I. C. p. 101.

† The absence of the tail-like appendages to the posterior wings in this specimen is probably due to mutilation.



I have not seen the female of this beautiful species, and its discovery is in a large part due to the encouragement given to Herr K unstler by Dr. Anderson, of the Indian Museum, Calcutta.

### 5. *Panchala trogon*.

*Panchala trogon*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xiv. p. 201 (1884).

Male. Wings above bright metallic emerald-green; nervures and nervules, extreme margins of the anterior wings, costal area, abdominal area, and posterior margin—narrowing from apex to upper median nervule and then broadly to anal angle—of posterior wings dark chocolate-brown; fringe and short tail-like appendage of the same colour, the latter with its apex greyish. Wings beneath purplish-brown, the lower half of anterior wings almost without the purplish reflections: anterior wings crossed by the following greyish lines:—two looped and macular crossing cell, two disco-cellular at end of cell (the innermost continued to third median nervule), two discal, waved and fractured, commencing near costa and terminating at third median nervule, and two submarginal, which are narrow and somewhat obsolete; from base of third median nervule to inner margin is a narrow greyish line, from which to outer angle the colour is greyish and before which is a small greyish spot: posterior wings darker purplish, the basal area beneath the median nervure clothed with long brownish hairs and with the following greyish lines:—four macular, arranged in transverse basal series, followed by three macular, situate one above and one within cell, and one irregular in shape beneath cell; these are followed by about four, much waved and fractured, crossing disk of wing, and a waved marginal line from apex to second median nervule, where there are three blackish spots, much covered with metallic greenish scales and outwardly bordered with greyish, extending to anal angle. Body above brownish; body beneath and legs somewhat paler.

Exp. wings, ♂, 36 millim.

HAB.—Malay Peninsula; Perak (K unstler—Calcutta Mus.).

This species is allied to both the *N. farquhari*, Dist., and the *P. aurea*, Hewits. (a Bornean species), by the metallic emerald-green colour above; it is, however, very distinct from both, not only by the different markings beneath, but also by the much smaller brownish markings on the upper surface of the wings.



FIG. 87.—*Panchala trogon* ♂.

### Genus AMBLYPODIA.

*Amblypodia*, Horsfield, Cat. Lep. E. I. C. p. 98 (1828); Moore, Lep. Ceyl. vol. i. p. 113 (1881).

Wings broad; anterior wings with the costal margin arched at base and convexly oblique to apex; outer margin moderately convex; inner margin slightly concavely sinuate. Costal nervure terminating on costa a little beyond end of cell; subcostal nervules five in male and four in female; first subcostal nervule emitted at about middle of cell, second rather nearer first than third, which is about midway between second and end of cell, third and fourth bifurcating near middle of third, fourth and fifth (*in male*) bifurcating about midway between base of fourth and apex of wing; cell broad; first and second median nervules emitted a little nearer together than second and third. Posterior wings subovate; costal margin obliquely convex; outer margin broadly rounded, elongated near anal angle, with a short tail-like appendage at apex of submedian nervure, the anal angle somewhat broadly lobate. Costal nervure convex and extending to apex; subcostal nervules bifurcating at about one-third before end of cell, which is broad; first and second median nervules emitted close together near end of cell, third emitted a little

beyond middle of cell. Body robust; palpi robust, porrect, the second joint extending about one-third in front of the eyes; third joint short. Antennæ gradually incrassated.

The note as to the geographical distribution of *Narathura* (*antea*, p. 260) must again suffice here, as it is uncertain how far the genus *Amblypodia*, as thus restricted, really extends. It is probable that its species are focussed in the Indo-Malayan region.

1. *Amblypodia narada*. (Tab. XXI., fig. 23 ♂.)

*Amblypodia narada*, Horsfield, Cat. Lep. E. I. C. p. 98, n. 30; *Th. N. L. c.* t. 1, f. 8 (1829).

Male. Wings above dark violaceous-blue; anterior wings with the costal and outer margins (the last most broadly) dark fuscous; posterior wings with the costal and outer margins dark fuscous, the abdominal margin paler fuscous. Wings beneath somewhat rufous-brown; both wings crossed by a narrow and somewhat waved fuscous fascia, which commences a little beneath the apex of anterior wings and terminates on posterior wings near middle of abdominal margin (this fascia is much more distinct in some specimens than in others); this is followed on both wings by two narrow broken fuscous fasciæ, very obscure on anterior wings, where they commence close together near apex, and more distinct on posterior wings, where they are margined with greyish towards anal angle; the lobular anal angle fuscous, with some greyish scales; tail-like appendage fuscous.

Exp. wings, ♂, 40 to 45 millim.

HAB.—Malay Peninsula; Penang (coll. Dist.); Malacca (Biggs—coll. Dist.).—Java (coll. Horsf.).

The female of this species is unknown to the writer, but is described by Horsfield as differing from the male in having the ground colour of the upper surface of the wings paler: "the blue patch has a light azure tint with a purple reflexion, is less widely diffused, especially in the posterior pair, and the borders are proportionally broad"; the colour beneath is also described as "gray."

Genus RAPALA.

*Rapala*, Moore, Lep. Ceyl. vol. i. p. 105 (1881).

Wings broad. Anterior wings with the costal margin arched at base, and then slightly convex, the outer margin obliquely convex, inner margin slightly concavely sinuate. Costal nervure terminating on costa nearly opposite end of cell; first subcostal nervule emitted beyond middle of cell; second and third subcostal nervules emitted nearer together than first and second; third and fourth bifurcating beyond the middle of third; first and second median nervules emitted at about half the distance that separates second and third. Posterior wings subovate, the costal margin arched at base and oblique to apex; outer margin convex, with a short tail-like appendage at apex of lower median nervule; subcostal nervules bifurcating at about one-third before end of cell; first and second median nervules emitted close together at end of cell.

Male with a tuft of hairs near base of inner margin of anterior wings, and with a broad conical-shaped glandular depression at base and between the costal and subcostal nervures of posterior wings. Body robust; palpi *mutilated* in the one specimen of (*R. amisena*) only available for examination.

This genus has been so recently proposed, and without the whole of its known species being enumerated, that it is impossible to properly define its area of distribution. One species is found in Ceylon, and others are known from the Malay Peninsula and Java. It is probably common to the Indo-Malayan Region.

I am only able to record one species as found in this fauna, and though another or others seem necessary to be added, I have, however, no adequate knowledge to justify their present incorporation. Thus Mr. Hewitson\* described (but not figured) a Singapore specimen, in the collection of Mr. Wallace, as a variety of the Javan species, *R. vivarna*, Horsf.; and Mr. Moore† refers to "*R. orseis* from Singapore," a species described by Mr. Hewitson (and not figured) as *Deudorix orseis*, ‡ and as from Sumatra.

### 1. *Rapala amisena*. (Tab. XXIII., fig. 13 ♂.)

*Amblypodia amisena*, Hewitson, Cat. Lyc. Brit. Mus. p. 13, n. 62, t. 7, f. 74, 78 (1862); Kheil, Rhop. der Insel. Nias. p. 33, n. 123 (1884).

Male. Wings above dark violaceous-blue; anterior wings with the costal and outer margins (very broadly at apex) dark fuscous; posterior wings with the costal and outer margins (the first broadly, particularly at apex, and the second narrowly) dark fuscous, the abdominal margin somewhat paler fuscous. Wings beneath dark brownish, with the following dark fuscous markings:—anterior wings with a linear spot near centre and one at end of cell, a waved and sinuated linear fascia between end of cell and apex of wing, preceded by a subcostal linear spot situate between the first and second subcostal nervules, and a submarginal series of small spots placed between the nervules; posterior wings with a short broken linear fascia near base, commencing at costal nervure and terminating near submedian nervure, a much-waved and sinuated linear fascia more or less outwardly margined with greyish, crossing wing beyond end of cell; a submarginal series of spots (largest beyond the upper median nervule) placed between the nervules, and three metallic greenish marginal spots, more or less centred with black, near anal angle; tail-like appendage fuscous, with the apex greyish-white. Body and legs more or less concolorous with wings. Extreme apex of antennæ ochraceous.

Exp. wings, ♂, 35 millim.

HAB.—Malay Peninsula; Singapore (Brit. Mus.; Kerr—coll. Dist.).

The female sex was evidently figured by Mr. Hewitson, and is much paler than the male. It was described as "Upperside dull lilac-blue. Anterior wings with the margins suffused with brown. Posterior wing rufous-brown, glossed with blue in the middle."

The species was originally described from a Singapore specimen, and I have only received it from that habitat.

### Genus DEUDORIX.

*Deudorix*, Hewitson, Ill. Diurn. Lep. p. 16 (1863); Moore, Lep. Ceyl. i. p. 102 (1881).

*Nadisepa*, Moore, Proc. Zool. Soc. 1882, p. 249.

*Baspa*, Moore, Proc. Zool. Soc. 1882, p. 250.

*Vadebra*, § Moore, Proc. Zool. Soc. 1883, p. 528.

Anterior wings subtriangular; costal margin arched at base, and more or less oblique to apex; outer margin either nearly straight or somewhat convex; inner margin slightly concavely sinuate. Costal nervure terminating on costa a little beyond end of cell; first subcostal nervule emitted beyond middle of cell, and at about the same distance from second as second is from third, which is emitted a very little before end of cell; third and fourth bifurcating a little beyond middle of third; first and second median nervules

\* Cat. Lyc. Brit. p. 13.

† Lep. Ceyl. vol. i. p. 105.

‡ Ill. Diurn. Lep. p. 23, n. 20 (1863).

§ This name has already been used, in an earlier part of the same volume (Proc. Zool. Soc. 1883), by Mr. Moore, for a proposed new genus in a section of *Euplœa*.

with their bases about half the distance apart as that separating second and third. Posterior wings somewhat elongately subovate; the costal margin convexly oblique to apex; the outer margin oblique, slightly waved; the anal angle lobately produced, and with a slender tail-like appendage at apex of lower median nervule; abdominal margin nearly straight and obtusely cleft near anal angle. Costal nervule strongly arched at base and extending to near apex; subcostal nervules bifurcating about one-fourth before end of cell; first and second median nervules emitted close together near end of cell; third at a little beyond middle of cell. Body robust; palpi porrect, second joint projecting a little in front of the head, third joint slender, nearly one-half the length of second in male, a little shorter than second in female. Antennæ long, with a distinct and well-formed apical club.

This genus is recorded from Continental India, Ceylon, the Andaman and Nicobar Islands, Burma, and the Malay Peninsula, and is found throughout the Indo-Malayan Region.

1. *Deudorix jarbas*. (Tab. XXIV., fig. 15 ♂; Tab. XX., fig. 26 ♀.)

*Papilio Jarbas*, Fabricius, Mant. Ins. ii. p. 68, n. 648 (1787); Don. Ins. Ind. t. 40, f. 3 (1800).

*Hesperia Jarbes*, Fabr. Ent. Syst. iii. p. 276, n. 65 (1793).

*Polyommatus Jarbas*, Godt. Enc. Méth. ix. p. 646, n. 108 (1823).

*Thecla Jarbas*, Horsf. Cat. Lep. E. I. C. p. 93, n. 26 (1829).

*Deudorix Jarbas*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 3 (1877).

*Nadisepa jarbas*, Moore, Proc. Zool. Soc. 1882, p. 249.

Male. Wings above bright sanguineous-red; anterior wings with the costal and outer margins (broadest at apex) dark fuscous, the basal half of cell and the nervures and nervules also dark fuscous; posterior wings with the outer margin very narrowly dark fuscous, the abdominal margin pale fuscous, the nervures and nervules very pale fuscous, the lobular anal angle ochraceous (sometimes containing a black spot), the margin greyish at the anal-angular area. Wings beneath greyish-brown, both wings with an obscure disco-cellular fascia at end of cells; a narrow and distinct fascia outwardly margined with greyish between end of cells and outer margins, which is dislocated, waved and sinuated near termination on posterior wings, and duplex above anal angle, and a fainter submarginal fascia, which is most distinct on posterior wings, where it is interrupted by a black marginal spot inwardly bordered with ochraceous between the second and third median nervules, followed by some scattered bluish scales, and a large black spot on the lobe at anal angle. Tail-like appendages fuscous, with their apices greyish. Body above fuscous; head greyish-white between the eyes; body beneath and legs more or less concolorous with wings.

Female. Wings above reddish-brown, the margins more obscurely fuscous than in male. Wings beneath as in male.

Exp. wings, ♂ and ♀, 30 to 40 millim.

HAB.—Continental India; N.W. Himalaya (Moore).—Malay Peninsula; Province Wellesley (colls. Saüer and Dist.); Perak (Townsend—coll. Godm. & Salv.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.).—Java (Horsf.).

2. *Deudorix sequeira*,\* n. sp. (Tab. XXIII., fig. 21 ♀.)

*Deudorix Petosiris*, Butl. (nec Hewits.), Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 1 (1877).

Female. Wings above violaceous-blue, the margins obscurely fuscous; a black spot at lobular anal angle of posterior wings. Wings beneath pale brownish; anterior wings with a disco-cellular fascia outwardly margined with greyish at end of cell; a narrow waved dark fascia outwardly margined with

\* Named after Diego Lopez di Sequeira, the early Portuguese voyager to Malacca.

greyish between end of cell and outer margin, and a fuscous marginal and submarginal fascia; posterior wings with a transverse dark fascia bordered with greyish at end of cell; a narrow and strongly dislocated fascia outwardly bordered with greyish (dislocated at the nervules from costa to second median nervule and then continuous and broader to abdominal margin) crossing wing between end of cell and posterior margin; a marginal and submarginal fascia as on anterior wings, a black marginal spot surrounded with greenish scales between the second and third median nervules, a patch of greenish scales between the third median nervule and submedian nervure, a black spot at lobular anal angle, and two small fuscous spots beneath costal nervure.

Exp. wings, ♀, 38 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).

The female specimen captured in Malacca by Capt. Pinwill, and presented to the British Museum, was identified in error by Mr. Butler as *D. petosiris*, Hew., a species, however, from which *D. sequeira* differs by the distinct markings on the under surface of the wings, such as the absence of the transverse spot in the cell of the anterior wings, and by the strongly dislocated transverse fascia to the posterior wings, &c. The male has still to be discovered, and will doubtless prove to have the wings above of some shade of rufous-brown. My collection contains a Burmese example of the true *D. petosiris*, which perfectly agrees with Hewitson's figure.

### 3. *Deudorix utimutis*,\* n. sp. (Tab. XXIII., fig. 22 ♂.)

*Deudorix pheretima*, Butl. (nec Hewits.), Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 2 (1877).

Male. Wings above dark rufous; a black spot at the lobular anal angle of the posterior wings. Wings beneath pale brownish, with a transverse dark brown spot margined with greyish, in and at end of cells of both wings, followed between ends of cells and outer margins by a narrow transverse dark brown fascia outwardly margined with greyish, which on posterior wings is strongly dislocated and sinuated from upper median nervule to abdominal margin, where it is considerably widened; an obscure submarginal fascia to both wings, and three marginal spots to posterior wings near anal angle, the first and third black, and the central one composed of greenish scales; extreme outer margin narrowly paler, the fringe dark.

Female. Wings above pale bluish, the margins irregularly pale fuscous. Wings beneath as in male.

Exp. wings, ♂ and ♀, 40 millim.

HAB.—Malay Peninsula; Penang (coll. Dist.); Malacca (Pinwill—Brit. Mus.).

A male specimen in the British Museum captured by Capt. Pinwill in Malacca, and a female Penang specimen in my own collection, are the materials which have induced the description of this species. Though Mr. Butler included it in his list of the Malaccan butterflies as *D. pheretima*, he now quite agrees with the writer as to its perfect distinctness from that species, as a reference to Hewitson's figure will testify. *D. pheretima*, Hew. (a Bornean species), not only has the spots and fasciæ on the under surface of the wings of a larger character than in *D. utimutis*, but also possesses a large spot above the cell of the posterior wings.

\* Dedicated to the memory of the unfortunate Malaccan rajah Utimutis, a victim to the mistaken ferocity of the early Portuguese settlers.

4. *Deudorix domitia*. (Tab. XXIII., fig. 7 ♂.)

*Deudorix Domitia*, Hewitson, Ill. Diurn. Lep. p. 19, n. 7, t. 6, f. 6, 7 (1863); Druce, Proc. Zool. Soc. 1873, p. 353, n. 1; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 4 (1877).

My only knowledge of this species is derived from the figure and description of Mr. Hewitson, both of which are reproduced here.

Upperside. *Male*.—"Rufous-brown. Anterior wing with a longitudinal rufous band within the cell; the anal lobe and the fringe at the base of the tails white."

"Underside yellow. Anterior wing with three black spots—one on the middle of the cell, a triangular spot on the costal margin beyond the middle, and a smaller spot between the second and third median nervules; the apex and a large spot on the inner margin grey. Posterior wing with one tail; the outer margin brown: the caudal spot, the lobe, and two spots between them black, irrorated with blue, and above these spots two parallel black lines."

"*Female* does not differ from the male, except that the underside is nearly white, the third spot of the anterior wing scarcely seen."

Exp. wings, "1 $\frac{3}{8}$  inch."

HAB.—Malay Peninsula; Singapore (coll. Wallace); Malacca (Pinwill—Brit. Mus.).—Borneo (Druce).

5. *Deudorix barthema*,\* n. sp.

*Deudorix Xenophon*, Hewits. (nec Fabr.), ♀, Ill. Diurn. Lep. p. 21 (1869).

*Myrina Megistia* (?), Butl. (nec Hewits.), Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 1 (1877).

*Female*. Wings above fuliginous-brown, with a black spot at the lobe of the anal angle of posterior wings. Wings beneath yellow, both wings with a very narrow and linear slightly darker fascia outwardly margined with greyish, situate between ends of cells and outer margins, angulated and inwardly margined with fuscous from the central median nervule of posterior wings to abdominal margin, where it is duplex; three marginal spots near anal angle of posterior wings, the first and third black, the central one composed of greenish scales; extreme outer margin narrowly greyish, the fringe pale brownish.

Exp. wings, ♀, 30 to 34 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Godfery—coll. Dist.).

I have not seen the male of this species, and I did not receive the other sex in time to have it figured on the plates. It is, however, closely allied in colour to the male of *D. domitia*, wanting, however, the black spots on the under surface of the anterior wings, which renders it easily distinguishable. I have refrained from giving a woodcut, owing to the little advantage that such would afford in portraying a plainly coloured and little marked insect.

## Genus LOXURA.

*Loxura*, Horsfield, Cat. Lep. E. I. C. p. 119 (1829); Moore, Lep. Ceyl. vol. i. p. 110 (1881).

Anterior wings subtriangular; costal margin strongly arched and convex, apex acute; outer margin almost straight and slightly oblique; inner margin nearly straight. Costal nervure short, terminating on costa before the end of cell; first subcostal nervule short, emitted a little beyond middle of cell and

\* Named after Ludovico Barthema, of Bologna, who is reported to have visited Malacca about 1503, or six years before the visit of Sequiera.

terminating nearly opposite end of cell, second emitted about midway between first and third, the third emitted at end of cell, third and fourth bifurcating beyond middle of third; second and third median nervules about one-third farther apart than first and second, the first emitted at end of cell; submedian nervure nearly straight and widely separated from the lower median nervule. Posterior wings elongately and irregularly subovate, the costal margin obliquely convex, the outer margin oblique and produced into a long tail-like appendage near apex of submedian nervure; abdominal margin concavely excavated near anal angle. Costal nervure arched and extending to apex; subcostal nervules bifurcating at about one-third before end of cell; first and second median nervules emitted close together near end of cell. Body moderately small; palpi very long, second joint projecting fully two-thirds in front of head, third joint about half the length of second; antennæ short, gradually thickened to apex.

This small genus is found in Continental India, the adjacent islands, and throughout the Indo-Malayan Region. Two species are here understood as found in this fauna.

1. *Loxura atymnus*. (Tab. XXIV., fig. 7 ♂.)

*Papilio Atymnus*, Cramer, Pap. Ex. iv. t. 331, D, E (1782).

*Hesperia Atymnus*, Don. Ins. China, t. 39, f. 1 (1798).

*Myrina Atymnus*, Godt. Enc. Méth. ix. p. 594, n. 5 (1823); Horsf. Cat. Lep. E. I. C. t. 2, f. 6, 6a (1823); Druce, Proc. Zool. Soc. 1874, p. 107, n. 1; Kheil, Rhop. der Insel. Nias, p. 32, n. 113 (1884).

*Myrina atymnus*, Druce, Proc. Zool. Soc. 1873, p. 353, n. 1.

*Loxura atymnus*, Horsf. Cat. Lep. E. I. C. p. 121, n. 49, t. 2, f. 6, 6a (1823); Boisd. Sp. Gén. i. t. 7, f. 3 (1836); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 51, n. 90 (1857); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 1 (1877); Moore, Proc. Zool. Soc. 1878, p. 835; *ibid.* 1882, p. 251; de Nic. J. A. S. Beng. vol. li. p. 63, n. 183 (1882).

Male. Wings above fulvous. Anterior wings with the costal area—very narrowly for about half its length—and the apex and outer margin broadly dark fuscous; base pale fuscous. Posterior wings with the base pale fuscous, the outer margin narrowly dark fuscous, the abdominal margin and lobular anal angle pale fuscous; tail-like appendage more or less streaked with pale fuscous, its apex greyish-white. Wings beneath bright ochraceous; both wings with a more or less distinct discal dark transverse fascia and a submarginal series of small spots (these fasciæ and spots are extremely variable in intensity of hue); lobular anal angle pale fuscous; tail-like appendage as above. Body above fuscous, beneath with legs more or less greyish.

Female. Resembling the male, but with the fuscous margins of the anterior wings rather broader, and having the costal margin more or less broadly pale fuscous to base.

Exp. wings, ♂ and ♀, 32 to 35 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—Moore); Sikkim (de Nicéville); Canara (Horsf. and Moore).—Tenasserim; Meetan, Moolai (Limborg—Moore).—Malay Peninsula; Province Wellesley (colls. Dist. and Saüer); Perak (Townsend—coll. Godm. & Salv.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.).—Siam; Chentaboon (Druce).—Nias Island (Kheil).—Java (Horsf.).—Borneo (Lowe—Druce).

Mr. de Nicéville found this species "common amongst clumps of bamboos" in Sikkim.\*

\* J. A. S. Beng. vol. li. p. 63 (1882).

2. *Loxura cassiopeia*.FIG. 88.—*Loxura cassiopeia*, ♂.FIG. 89.—*Loxura cassiopeia*, ♀.

*Loxura cassiopeia*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xiv. p. 200 (1884).

Male. Wings above dark reddish ochraceous; anterior wings with the costal margin (as far as subcostal nervure) and the outer margin (broadest at apex) fuscous or black, the base tinged with olivaceous-brown; posterior wings with the outer margin fuscous (darkest at apex), the fringe ochraceous, the base and abdominal area more or less olivaceous-brown, the tail-like appendage ochraceous, with an obscure central reddish line, and the apex whitish. Wings beneath bright ochraceous, with the following brownish spots:—anterior wings with one about centre of cell, three disco-cellular and contiguous at end of cell, and beyond these are two separated by the second subcostal nervule; a waved macular discal band and a submarginal series of very small and somewhat obsolete spots: posterior wings with some obscure basal spots, a macular band crossing disk, but not extending below third median nervule, and a submarginal series of small obscure spots as on anterior wing. Body above fuscous, beneath greyish; legs and palpi blackish, speckled with greyish.

Female. Resembling the male, but with the posterior wings above shaded with fuscous, which is darkest on the costal and outer margins.

Exp. wings, ♂ and ♀, 34 to 35 millim.

HAB.—Malay Peninsula; Perak (Künstler—Calc. Mus.).

The nearest ally of this species is the *L. prabha*, Moore, from the Andaman Islands.

——— *marciana*. (Tab. XXIII., fig. 16 ♀.)

*Myrina marciana*, Hewitson, Ill. Diurn. Lep. p. 34, n. 22, t. 12, f. 12, 13 (1863); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 549, n. 4 (1877).

The figure here given is taken from the Malaccan specimen contained in the British Museum, and referred to as above by Mr. Butler. I have since examined this specimen, and find it is considerably mutilated, and that it should in a perfect condition possess two tail-like appendages to the posterior wings. It thus evidently belongs to the genus *Tajuria*, but I have thought it better to merely refer to the figure on this occasion, and to endeavour to obtain perfect specimens to allow of a proper description in the subsequent appendix to this volume.



## Fam. PAPILIONIDÆ.

*Papilionidæ*, Leach, Sam. Comp. p. 234 (1819); Swains. Phil. Mag. ser. 2, vol. i. p. 187 (1827); Westw. Introd. Mod. Class. Ins. p. 347 (1840); Bates, Journ. Ent. vol. i. p. 219 (1861); ib. vol. ii. p. 177 (1864); Moore, Lep. Ceyl. vol. i. p. 116 (1881); Marsh. & de Nic. Butt. Ind. Burm. & Ceyl. vol. i. p. 18 (1882).

Six perfect legs in both sexes. Discoidal cells of wings perfectly closed. Pupa secured by the tail and a girdle across the middle.

Under the name of *Papilio*, Linnæus originally grouped as one genus all the day-flying Lepidoptera; the name is now usually restricted to one very large genus, which perhaps, from the size and diversiformity of its species, is the best known of any of the Rhopalocera. It likewise now dictates the construction of the above family name, which comprises the two well-marked and extensive subfamilies *Pierinæ* and *Papilioninæ*, both of which from the variety and beauty of the butterflies which are thus divisionally classified, have long been the pride of the amateur's collection, and the admiration of all lovers of Nature.

Another result of their handsome appearance is that they are better known by name or individuality than most other butterflies, and consequently observations made by non-entomological observers can be with some degree of certainty connected with the true species, which is more than can be said for many other insects thus referred to, by which the value of numerous entomological facts and observations recorded in books of travel is frequently destroyed.

## Subfam. PIERINÆ.

*Pierinæ*, Swainson, Cab. Cycl. p. 87 (1840); Bates, Journ. Ent. vol. ii. p. 177 (1864); Moore, Lep. Ceyl. vol. i. p. 116 (1881); Marsh. & de Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 18 (1882).  
*Pieridæ*, Dup. Cat. Lep. Fr. p. 23 (1846); Doubl. Gen. Diurn. Lep. p. 32 (1847); Trim. Rhop. Afr. Austr. p. 24 (1862).  
*Pierides*, Westw. Introd. Mod. Class. Ins. p. 349 (1840); Voll. Faun. Ind-néerl. Mon. Pier. p. 1 (1865).

Abdominal margin of the hind wing not curved inwardly, nor channelled, to receive the abdomen. Larvæ more or less

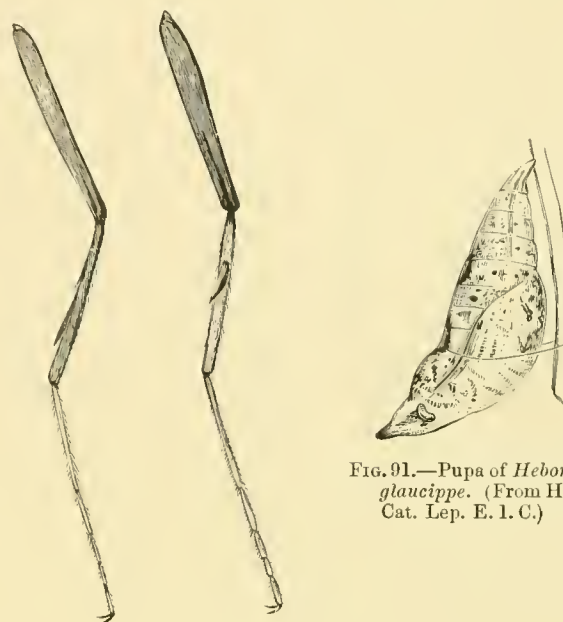


FIG. 90.—Anterior legs (showing tarsi) of *Ornithoptera hephaestus* var.

FIG. 91.—Pupa of *Hebomoia glaucippe*. (From Horsf. Cat. Lep. E. I. C.)



FIG. 92.—Larva of *Hebomoia glaucippe*. (From Horsf. Cat. Lep. E. I. C.)

pubescent and attenuated at each end without any nuchal tentacles. Anterior tibiæ not provided with a medial spur.\*

In this large and well-known subfamily considerable variation ensues in the neuration of the wing (a character of great differential value in the diagnosis of genera), and also in the structure of the antennæ. The *Pierinae* are very well represented in the Malayan Region, and have induced the publication of two fine monographic works by the late Dr. Snellen van Vollenhoven † and Mr. Wallace, ‡ whilst a study of the neuration of the whole subfamily with a view of generic division has been attempted by Mr. Butler. §

Like the *Lycanidæ*, the *Pierinae* are ubiquitous, are recorded from the highest latitudes of butterfly distribution, and also produce some of the best known and most abundant species found in either temperate or tropical areas. It is, however, in the tropics that the *Pierinae* reach their full maximum of colour decoration, the plain whites and brimstones of the Palearctic area being frequently shaded by the most vivid hues in tropical regions.

But the most remarkable features connected with the *Pierinae* are their gregarious and migratory habits. Of the first peculiarity we have many independent records from different parts of the world, a few only of which can here be recapitulated. In South Africa Mr. Trimen bears witness that "the habits of the species of this division are often gregarious or pseudo-gregarious, as considerable numbers of one kind are often found about some favourite spot or attractive flowers; and little clusters of some species of 'Whites' may frequently be seen congregated on the damp mud at the margins of pools or brooks."|| This was strongly witnessed in South-west Celebes by M. C. Piepers, and well described by that entertaining entomologist. When travelling in that region,—to use his own words,—“my companion suddenly exclaimed, as we were crossing a nearly dry brook, ‘Oh, look what a beautiful flower!’ And on looking where he pointed I saw in the bed of the stream, amongst the damp gravel, a beautiful orange-coloured flower with a white centre, about ten centimetres in diameter. The strangeness of the occurrence led me to step nearer in order to observe it more closely, when what did I see?—the flower consisted of two concentric rings of butterflies (*Callidryas scylla*, Linn.), which had closed their wings (which are yellow, and orange beneath), and were busily sucking up the moisture from the damp sand, and thus represented in the most closely deceptive manner the petals of a flower. They surrounded five of another white species of *Pieris* similarly occupied, which thus seemed to form the white centre of the flower. I still remember the amazement of my travelling companion, when on my nearer approach the whole flower dissolved into a swarm of butterflies.”¶

It was probably *Pierinae*, or principally butterflies belonging to that subfamily, which surprised and delighted Mr. E. L. Arnold in Southern India, on one of his excursions in the dry season. He graphically relates that he “came upon a quiet nullah meandering through the jungle. The bed by chance, just there, was broad and sandy, and the stream a single

\* The two subfamilies may also, apparently, be separated by their mode of flight, as Dr. Collingwood, who observed both in Borneo, describes “the swift flight, now over the tops of the trees, now down near the ground,” as characteristic of the *Pierinae*, whilst the *Papilioninae* were distinguished “by their strength of wing and straight headlong course” (“The Lepidopt. of Labuan”—‘Entomologist,’ 1868, p. 14).

† Faun. Ind.-Neerl. Mon. Pier. 1865.

‡ Trans. Ent. Soc. 1867.

§ Cistula Entomologica, vol. i. (1870).

¶ Rhop. Afr. Austr. p. 25.

\* Tijds. Ent. xix. pp. xviii to xxiv, and English translation by Kirby, ‘Entomologist,’ x. p. 267.

thread that seemed every moment in danger of vanishing. But to my astonished eyes the whole place appeared a garden of flowers of a thousand colours, and crowded so close by the water that the sand could scarcely be seen. I looked and looked again, and then stepped down to observe the parterre closer; but as I did so these animated blossoms sprang into the air in a huge cloud, and the truth was plain that they were a countless host of thirsty butterflies, collected from the forest all round to drink at this thread of liquid."\* Sometimes these swarms appear both suddenly and unexpectedly, as related of a species, *Terias lisa*, in Bermuda. According to Mr. Jones, the butterfly was first observed on "10th October, 1847, on which day it suddenly appeared in great abundance, hundreds being seen in every direction. . . . They all disappeared, however, in the course of a few days."†

This brings us to the subject of migration, and here we are again indebted to Mr. Jones for an excellent account of a swarm of this same species which visited the Bermudas in October, 1874. "Several persons living on the north side of the main island perceived, as they thought, a cloud coming over from the north-west, which drew nearer and nearer to the shore, on reaching which it divided into two parts, one of which went eastward and the other westward, gradually falling upon the land. They were not long in ascertaining that what they had taken for a cloud was an immense concourse of *Terias lisa*, Boisd., which flitted about all the grassy open patches and cultivated grounds in a lazy manner, as if fatigued after their long voyage over the deep. Fishermen out near the reefs, some few miles to the north of the island, very early that morning, stated that numbers of these insects fell upon their boats, literally covering them. They did not stay long upon the island."‡ During Mr. Spruce's sojourn in South America he witnessed large flocks of butterflies pass across the Amazons near the mouth of the Xingú in November, 1849, in a direction from about N.N.W. to S.S.E., evidently in the last state of fatigue, "all of common white and orange-yellow species." The little wind there was blew from E. to N.E., and therefore the butterflies steered their course at right angles to it.§ In Ceylon Sir Emerson Tennent watched the "extraordinary sight" "of flights of these delicate creatures, generally of a white or pale yellow hue, apparently miles in breadth, and of such prodigious extension as to occupy hours, and even days, uninterruptedly in their passage—whence coming no one knows; whither going no one can tell."|| On Sunday, July 5th, 1846, an enormous flock of white butterflies arrived at Dover from the French coast. It was described as being so extensive as to pass like a cloud of snow.¶ The late Mr. Darwin describes one such swarm which he witnessed when about ten miles from the Bay of San Blas. "Vast numbers of butterflies, in bands or flocks of countless myriads, extended as far as the eye could range. Even by the aid of a telescope it was not possible to see a space free from butterflies. The seamen cried out 'it was snowing butterflies'; and these again were principally *Pierina*, as Mr. Darwin found the most common butterfly to be a species of the genus *Colias*."\*\*

The pseudonymous 'Eha,' who has written so pleasantly of Natural History in India, observes that "butterflies of some kinds—especially those energetic greenish-white ones of the

\* 'On the Indian Hills,' vol. ii. p. 314.

† 'Psyche,' Dec. 1875, No. 20, p. 121.

|| Nat. Hist. Ceylon, p. 403.

\*\* 'Voyage of the Beagle,' p. 158.

† 'Naturalist in Bermuda,' p. 120.

§ Journ. Linn. Soc., Zool. vol. ix. p. 356.

¶ J. Pemberton, 'Zoologist,' vol. iv. p. 1442.

family surnamed *Callidryas*\*—are sometimes seized with a mania for migrating to the far West. . . . I have stood near one of the parade-grounds at Poona, and watched them, with scarce a pause to rest their wings or sip a flower, from eight or nine o'clock until the afternoon, as far as eye could reach, the host kept streaming past, like the fugitive Gauls after one of Cæsar's great battles." †

These interesting facts could be multiplied if our space permitted, and the only reason why they have been thus somewhat amply recorded, is to show, what an interesting, and phenomenal phase of butterfly existence, still requires a scientific explanation.

In my treatment of the neuration of these *Pierinae*, I am not altogether in unison with the views of my contemporaries Messrs. Butler and Moore, who also differ somewhat in this respect from one another. I only recognise a discoidal nervule, as such, when its basal emergence is distinctly traced from some portion of the end of the cell. Mr. Butler has a contrary opinion, and treats as a discoidal nervule what I consider as a lower subcostal nervule. The genus *Delias* affords a good example. In this genus Mr. Butler counts three subcostal nervules; ‡ I enumerate four, the difference being due to a divergence of view as to what is really a discoidal nervule. Here I am supported by Mr. Moore, whose view, however, of this nervule is somewhat capricious, as in *Hebomoia* he describes five subcostal nervules, § whilst Mr. Butler and myself can see but four.

#### SYNOPSIS OF GENERA.

##### 1. Anterior wings with one discoidal nervule.

###### A. Anterior wings with four subcostal nervules.

a. Discoidal nervule of anterior wings emitted near upper end of cell. - - - - - LEPTOSIA.

aa. Discoidal nervule of anterior wings emitted at middle apex of cell. - - - - - DELIAS.

###### B. Anterior wings with five subcostal nervules.

b. Upper disco-cellular nervule of anterior wings longer than lower. - - - - - PRIONERIS.

bb. Upper disco-cellular nervule of anterior wings shorter than lower.

c. First subcostal nervule of anterior wings emitted at about middle of cell. - - - - - CATOPSILIA.

cc. First subcostal nervule of anterior wings emitted beyond middle of cell.

d. First and second subcostal nervules emitted somewhat close together near end of cell.

c. Third and fourth subcostal nervules bifurcating near apex of wing. - - - - - UDAIANA. ||



FIG. 93.—Arrangement of nervules in anterior wing of *Delias parthenope*.



FIG. 94.—Arrangement of nervules in anterior wing of *Udaiana cynis*.

\* The writer evidently means the genus *Callidryas*, which is now correctly restricted to American species. Hübner's earlier genus *Catopsilia* embraces all the Old World species. It is usual to find these butterflies spoken of as "Callidryads" in the East; but it is also common to hear about boa-constrictors, alligators, humming birds, &c., inhabiting the same region!

† 'The Tribes on my Frontier,' p. 113.

‡ Cist. Entom. vol. i. p. 55.

§ Lep. Ceyl. vol. i. p. 127.

|| Gen. nov. type *Pieris cynis*, Hewitts. Mr. Butler (Cist. Ent. vol. i. p. 49, 1870) gave this species as the type of his genus *Phrissura*. He subsequently (Trans. Ent. Soc. 1871, p. 171) stated that this was an error, and that the species "agrees in venation, and in every other character, with the species of the genus *Belenois*." But the type of *Belenois*, as given by Mr. Butler himself (Cist. Ent. vol. i. p. 34), is the *Papilio Calypso*, Dru., a species in which the first subcostal nervule is more or less anastomosed with the costal nervule, a character not applicable to *P. cynis*, and I have therefore been compelled to erect a new genus for its reception.



FIG. 95.—Arrangement of nervules in anterior wings of *Dercas gobrias*.



FIG. 96.—Arrangement of nervules in anterior wing of *Saletara nathalia*, ♂.



FIG. 97.—Arrangement of nervules in anterior wing of *Nepheronia hippia*.

- ee. Third and fourth subcostal nervules bifurcating almost midway between end of cell and apex of wing.
- f. Discoidal cell about half the length of anterior wings. - - - - - TERIAS.
- ff. Discoidal cell not half the length of anterior wings. - - - - - DERCAS.
- dd. First and second subcostal nervules emitted some distance before end of cell.
- g. Third and fourth subcostal nervules bifurcating about midway between end of cell and apex of wing. - IXIAS.
- gg. Third and fourth subcostal nervules bifurcating near apex of wing. - - - - - APPIAS.
- C. Anterior wing with five subcostal nervules in male and four in female.
- ggg. Third and fourth subcostal nervules bifurcating in male at extreme apex of wing. - - - - - SALETARA. \*
- 2. Anterior wings with two discoidal nervules.
- C. Anterior wings with four subcostal nervules. - - - - - HEBOMOIA.
- D. Anterior wings with five subcostal nervules. - - - - - NEPHERONIA.

Genus LEPTOSIA.

*Leptosia*, Hübner, Verz. bek. Schmett. p. 95 (1816); Scudd. Proc. Am. Arts & Sci. vol. x. p. 204, n. 618 (1875).  
*Nychitona*, Butl. Cist. Ent. vol. i. pp. 34, 41 (1870); Moore, Lep. Ceyl. vol. i, p. 117 (1881),  
*Nina*, Horsf. Cat. Lep. E. I. C. p. 140 (1829).  
*Pontia*, Boisd. (nec Fabr.), Spec. Gén. i. p. 430 (1836).

Anterior wings subpyriform; costal margin arched and convex; apex rounded; outer margin very convex; inner margin nearly straight, very slightly sinuate. Costal nervure terminating nearly opposite end of cell; first subcostal nervule emitted beyond middle of cell, second a little before end of cell, third and fourth bifurcating at about one-third from base of third; lower disco-cellular nervule inwardly bent and angulated, upper minute; discoidal nervule emitted from near upper apex of cell; upper median nervule somewhat convex, second and third wide apart. Posterior wings subovate; costal margin slightly oblique, posterior margin strongly convex, abdominal margin oblique towards anal angle. Costal nervure short, terminating on costa nearly opposite end of cell; first subcostal nervule emitted beyond middle of cell, curved and extending to apex, second at a short distance before end of cell; upper disco-cellular directed outwardly, lower more or less inwardly bent and angulated; position of the discoidal and median nervules as in anterior wing. Body slender; palpi moderately short, and strongly pilose beneath; antennæ with a long compressed and pointed apical club.

This is a small but widely distributed genus. It is found in Tropical and Southern Africa, Madagascar, Continental India, and generally throughout the Malay Peninsula and Malayan Archipelago, absent—according to Mr. Wallace†—from the Moluccas and New Guinea, but extending through the islands east of Java to Timor, and thence into North-West Australia.

Mr. Wallace, who had opportunities of observing the habits of these butterflies, has stated that they “fly about slowly in woods and shady places, keeping near the ground, and often settling on leaves and flowers.”‡

The fragile butterflies of this genus, which possess a facies distinct from most of the other *Pierine*, and have a more or less superficial resemblance to the *Lycenad* genus *Liptena*,

\* Gen. nov. type *Pieris nathalia*, Feld.

† Trans. Ent. Soc. ser. 3, vol. iv. p. 316 (1867).

‡ Ibid.

appear to be a very ancient and little differentiated generic group. This is evidenced by their wide geographical distribution as a genus, the extremely large area in which two, at least, of the species\* are also found, and their generically distinct appearance combined with smallness of specific differentiation.

### 1. *Leptosia xiphia*. (Tab. XXVI., fig. 8.)

*Papilio Xiphia*, Fabricius, Spec. Ins. ii. p. 43, n. 180 (1781); Mant. Ins. p. 20, n. 204 (1787).

*Papilio Nina*, Fabr. Ent. Syst. iii. 1, p. 194, n. 604 (1793).

*Pieris Nina*, Godt. Enc. Méth. ix. p. 162, n. 147 (1819).

*Pontia Nina*, Horsf. Cat. Lep. E. I. C. p. 140, n. 66 (1829); Boisd. Sp. Gén. i. p. 431, n. 2 (1836); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 69, n. 130 (1857); Voll. Faun. Ind-Néerl. Pier. p. 3, n. 1 (1865); Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 317, n. 1 (1867); Snell. Tijd. Ent. xix. p. 16, n. 55 (1876); Lep. v. Midden-Sumatra, p. 22, n. 1 (1880).

*Pontia Xiphia*, Butl. Cat. Fabr. Lep. p. 229, n. 2 (1869); Druce, Proc. Zool. Soc. 1873, p. 354, n. 1; *ibid.* 1874, p. 107, n. 1.

*Nehitona Xiphia*, Moore, Proc. Zool. Soc. 1878, p. 837; Lep. Ceyl. vol. i. p. 118 (1881).

Var. *a. Leptosia Chlorographa*, Hübn. Zutr. Ex. Schmett. f. 47, 48 (1818).

Male and Female. Wings above white. Anterior wings with the costal margin narrowly blackish, the basal third of which is spotted with greyish, apex, and a large spot at about centre of upper median nervules black. Anterior wings beneath with the costal area and apex speckled with fuscous strigæ; an outer marginal series of small black spots, and the discal spot as above, but paler. Posterior wings beneath crossed with irregular fuscous strigæ, those on the disk assuming the form of transverse fasciæ. Body above blackish, beneath greyish; legs greyish, streaked with fuscous.

Exp. wings, ♂ and ♀, 40 to 44 millim.

HAB.—Continental India; Bombay (Leith—coll. Dist.); Calcutta (de la Chaumette).—Ceylon (Thwaites—coll. Dist.).—Tenasserim; Ahsown (Limborg—Moore).—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Malacca (Wallace).—Siam; Chentaboon, Naheonchaisee (Druce).—Sumatra (Snellen).—Java (Horsfield).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).—Bali (Wallace).—Flores (Wallace).—Timor (Vollenhoven).—Philippine Islands (Brit. Mus.).

Mr. Wallace, who examined a long series of this species from many habitats, states that it varies but little throughout its extensive range, and that the specimens from the Philippine Islands “are very large.” † Some variation does, however, ensue, Vollenhoven writes, “Chez un individu de Sumatra le sommet des ailes supérieures est presque entièrement blanc en dessous. Les individus de Timor ont la tache post-cellulaire plus grande que les autres.” ‡ Horsfield found it “by no means unfrequent” in Java; § but it appears to be a moderately scarce insect in the Malay Peninsula. In North-Western India, Capt. Lang only met with it “in one place, a forest in the interior of Oudh, in the month of October,” where it seemed “to be afraid to fly boldly from the shelter of the bushes.” || Capt. de la Chaumette, however, found it “in great abundance in Calcutta, flying very softly about as if blown by the wind,” and during the months of March and April. ¶ It would appear to be found nearly all the year round, as Mr. Hutchison, in Ceylon, records it as found at Matale in August, and from June to December, in gardens at Colombo.\*\*

\* *L. alcesta* in the Ethiopian, and *L. xiphia* in the Oriental Regions.

† Trans. Ent. Soc. ser. 3, vol. iv. p. 317 (1867).

‡ Faun. Ind-Néerl. Pier. p. 4.

§ Cat. Lep. E. I. C. p. 141.

|| Ent. Mo. Mag. vol. i. p. 102.

¶ *Ibid.* vol. ii. p. 36.

\*\* Moore, Lep. Ceyl. vol. i. p. 118.

## Genus DELIAS.

*Delias*, Hübner, Verz. bek. Schmett. p. 91 (1816); Butl. Cist. Ent. vol. i. p. 40 (1870); Moore, Lep. Ceyl. vol. i. p. 139 (1881).

*Cathamia*, Hübn. Verz. bek. Schmett. p. 92 (1816).

*Pontia*, Hübn. (nec Fabr.), Verz. bek. Schmett. p. 92 (1816).

*Thyca*, Wallengr. Svensk. Acad. Förh. 1858, p. 76; Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 344 (1867).

*Pieris*, sect. 1, Doubl. Gen. Diurn. Lep. p. 44 (1847).

Anterior wings somewhat elongate; costal margin moderately convex, the apex rounded, outer margin obliquely rounded, inner margin nearly straight. Costal nervure extending to about two-thirds of wing; first subcostal nervule emitted at about one-fourth before end of cell, second and third bifurcating near apex of second, fourth springing from second at about one-third beyond end of cell; upper disco-cellular obliquely directed outwardly, lower disco-cellular somewhat concave; discoidal nervule emitted at central apex of cell; median nervules emitted wide apart, first and second a little nearer to each other than second and third. Posterior wings elongately subovate; the costal margin oblique, the posterior margin convex, abdominal margins obliquely divergent towards anal angle. Costal nervure extending to about two-thirds of costal margin, first subcostal nervule emitted at about one-third before end of cell, second almost midway between bases of the first and of the discoidal nervule; upper disco-cellular oblique, lower disco-cellular very slightly concave; upper median nervule emitted at apex of cell, second and third median nervules almost twice as wide apart at base as first and second; submedian nervure slightly curved outwardly; internal nervure reaching about centre of abdominal margin. Body somewhat robust; head and pronotum clothed with long hairs; palpi porrect, extending considerably beyond the head, and clothed with long hairs beneath; legs long and slender; antennæ with a well-formed and moderately channelled apical club.

This is an extremely large genus, and one in which the coloration of the wings assumes a most vivid and extraordinary character. It is on the under surface of the wings that the most brilliant hues and markings are found, and these are often of a bizarre and ostentatious description. Mr. Wallace has thought that these butterflies may have some special protection which renders the disguise of sombre colours unnecessary, and this seems the more probable when it is found that some of them are the subjects of "mimicry" by species of the genus *Prioneris*.\*

*Delias* has a wide geographical distribution; it inhabits Continental India and the neighbouring islands, Burma, the Malay Peninsula, the length and breadth of the Malayan

\* Trans. Ent. Soc. ser. 3, vol. iv. p. 344.

This exposure of the gaily-coloured under surfaces of the wings is often equalled in moths where a bright-coloured upper surface is only seen when at rest. Protection is, however, generally afforded in some respect. Mr. Johnston observed such a case on the banks of the Congo. He saw such a moth sitting "complacently, not fearing to attract attention by the magnificent carmine of the upper side of the wings, although their underside is leaf-brown and 'protective' in colour, and, if the creature liked, would when closed render it quite indistinguishable from the dead and scrubby foliage it haunts" ('The River Congo,' p. 330). In this case, however, the same author remarks that he was never able to secure it, "for the reason that it enters a tangle of thorny bush where capture is impossible," and that it was there he thus observed it. Difficulties, however, do occur in the thorough explanation of facts afforded by the theories of "mimicry" and "protective resemblance." Thus Mr. Johnston, who is a thorough evolutionist, remarks that "large green mantises or 'praying insects' are chasing small flies with their great pouncing fore legs, and every now and then a blue roller-bird snaps up a mantis in spite of its wonderful assimilation to its leafy surroundings" ('The River Congo,' p. 37). Another new feature in the theory of mimicry is afforded by that competent travelling naturalist, Mr. Herbert Smith. In Brazil he noticed spiders which mimic ants, but the peculiarity was that the spiders "eat the particular ants which they mimic." But, as Mr. Smith remarks, "It is difficult to suppose that the quick-witted ants would be deceived, even by so close a resemblance; and in any case it would seem that the spiders do not require such a disguise to capture slow-moving ants." The supposition is therefore hazarded that as ants enjoy an immunity from the attacks of birds, the spiders thus acquire a similar protection from the same enemies" ('Brazil, the Amazons, and the Coast,' p. 223).

Archipelago, North Australia, many of the Pacific Islands, and is found as far north as China. Mr. Wallace had many opportunities of observing the habits of these butterflies, in more than one habitat, and he reports that "they all fly weakly and slowly, yet they are by no means rare, since in almost every locality I found some of the species very abundant in the forests, flying lazily along near the ground, sometimes settling on a flower, but more generally seeming to wander aimlessly through the pathless recesses of the forest."\*

Seven species of *Delias* are here included as found in this fauna.†

1. *Delias dione*. (Tab. XXIV., fig. 5 ♂, 6 ♀.)

*Papilio Dione*, Drury, Ill. Ex. Ent. ii. t. 8, f. 3, 4 (1773).

*Delias pasithoe* var. *dione*, Butl. Proc. Zool. Soc. 1872, p. 29, n. 6.

*Delias dione*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 2 (1877).

Male. Anterior wings above very dark indigo-blue; the basal half pale bluish, with the extreme base, costal and inner marginal areas and neuration dark indigo-blue; a small pale spot beyond cell, and a submarginal series of pale linear ray-like spots placed between the nervules. Posterior wings above dark indigo-blue, the basal half pale bluish, the abdominal margin more or less yellowish, the extreme base dark indigo-blue; a small pale spot at end of cell, and a marginal series of pale linear ray-like spots, but less distinct than those on anterior wings. Anterior wings beneath dark fuscous, a broad and irregular greyish fascia crossing very near centre, divided by the fuscous neuration; a pale spot beyond cell as above, and the submarginal spots as above, but larger and more greyish. Posterior wings yellow, the basal third, the neuration and the outer margin blackish, the last widening at apex, and apparently containing five yellow spots; the basal black area crossed by a bright carmine-red fascia. Body above indigo-blue, thorax beneath and legs blackish. Abdomen beneath greyish.

Female. Wings above dark fuscous; anterior wings with a broad irregular central greyish fascia divided by the fuscous neurations, and a submarginal series of greyish linear spots; posterior wings crossed by an oblique, broad, greyish fascia near base, divided by the dark neuration. Wings beneath as in male, the central fascia to anterior wings broader and absorbing the spot at end of cell; posterior wings with the yellow colour paler and more greyish.

Exp. wings, ♂ and ♀, 65 to 72 millim.

HAB.—Malay Peninsula; Province Wellesley (colls. Sauer & Dist.); Malacca (Pinwill—Brit. Mus.).—Borneo (Brit. Mus.).

This species is intermediate between *D. pasithoe*, Linn., a species found in Continental India, and *D. egialea*, Cram., which is a Javan species. It is one of the many distinct forms or species found in this region, in which more or less common features bear witness to a common progenitor.‡

\* Trans. Ent. Soc. ser. 3, vol. iv. p. 344.

† In a synonymic list of the species of *Delias* (Proc. Zool. Soc. 1872, p. 29), Mr. Butler has given *D. hierte*, Hübn., *D. eucharis*, Dru., and *D. descombesi*, Boisd., as found in Penang, but I have as yet failed to find any corroboration of the fact of such species being found there.

‡ The Rev. L. C. Biggs has given some interesting facts relating to this butterfly, under the name of *Delias Ægialea*. He speaks of it as the "common coasting butterfly," and describes it as being found sometimes in an "apparently endless stream" all following one direction, and numbering twenty to thirty in sight per minute from any one point, but forming a belt several miles broad, extending far inland from the coast, and from morning till night continuing to pass any fixed point for a fortnight or more. "It seems seldom to feed or alight during these migrations, except at night or in early morning, when with dawn it resumes its flight. . . . Now and then it is entangled in a sort of *eul de sac*, formed by thick clumps of fruit trees, or the high walls of houses, against which it will dash itself repeatedly and recklessly, willing to persevere until death. This is especially apt to be the case when a strong head wind is blowing against it" ("Monthly Packet," vol. ii. pp. 186-7, 1881).



## 2. *Delias parthenope*. (Tab. XXIV., fig. 4 ♂.)

*Thyca parthenope*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 347, n. 8, t. 6, f. 5, 5a (1867); Butl. Proc. Zool. Soc. 1872, p. 29, n. 1.

Male. Anterior wings above blackish, with the following bluish-grey markings:—a broad cellular streak, a large spot occupying about two-thirds of the area between the third median nervule and the submedian nervure, a smaller spot between the second and third median nervules, a sublunate spot at end of cell, two contiguous spots beyond end of cell (these are sometimes fused with the marginal spots), and a series of submarginal elongate spots placed between the nervules, of which the two lowermost are shortest and more or less relieved with greyish. Posterior wings above with a bright carmine-red patch at base, and occupying basal third of cell, which is followed by a transverse bluish patch: apex of cell and the area from the upper median nervule to apex of wing blackish, remaining portion bright yellow: neuration and outer margin black, narrowing towards anal angle and inwardly angulated at the nervules. Anterior wings beneath as above, but with the spots larger and more marked with greyish. Posterior wings beneath with a large and outwardly transverse basal patch of carmine-red, broadly margined with blackish; remainder of wing bright yellow, the neuration and outer margin black. Body above and thorax beneath, with legs, black, shaded with bluish; abdomen beneath greyish.

Exp. wings, ♂, 55 to 70 millim.

HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.); Province Wellesley (colls. Dist. and Sauer); Singapore (Wallace).

The female of this species is unknown to the writer, and the male was alone described by Mr. Wallace. It is allied to the Indian *D. pyramus*, and bears a similar relationship to that species as we have seen to exist between *D. dione* and *D. pasithoë*.

## 3. *Delias ninus*.

*Thyca ninus*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 347, n. 9, t. 7, f. 1 (1867).

*Delias ninus*, Butl. Proc. Zool. Soc. 1872, p. 29, n. 2.

This species is only known to the writer by the figure and description given by Mr. Wallace, both of which are here reproduced.

“Closely allied to *T. pyramus*, Wall. *Male*.—Wings broader, uppers more triangular, the outer margin not concave and produced. Above: upper wings marked nearly as in *T. pyramus*, but the ground colour is blacker, and the basal patches bluer and less elongate; lower wings with the red patch at the base much smaller, not filling one-third of the cell, below it a broad transverse bluish-ashy band, paler at the abdominal margin, a large ochre-yellow patch at the anal angle divided into four parts by the nervures; outer angle black, without whitish markings. Beneath almost exactly as in *T. pyramus*, but the red semicircle does not extend quite so far down, and the posterior markings of the hind wing are more clearly defined, and of a nearly uniform ochre-yellow.”

Exp. wings, “3 inches.”

HAB.—Malay Peninsula; Malacca; Mount Ophir (coll. Wallace).

Mr. Wallace accurately states the systematic position of his species in the following terms:—  
“This insect differs so clearly in form, size, markings, colouration, and locality from its allies,



FIG. 98.—*Delias ninus* ♂.

that I have felt obliged to give it a different name, although its general appearance is such that many entomologists would at once pronounce it 'a mere variety.' Male specimens were only taken by myself at Malacca."

Mr. Wallace appears to have been perfectly justified in this course. The amount of differentiation is equivalent to what is considered as specific by entomologists, subject of course to the final ruling of the breeder of this and the allied species.

#### 4. *Delias ithiela*.



FIG. 99.—*Delias ithiela*.

*Thyca Ithiela*, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. iv. p. 242 (1869).

*Delias Ithiela*, Butl. Lep. Ex. p. 62, t. xxiv. f. 1 (1871); Proc. Zool. Soc. 1872, p. 30, n. 13.

This is another of those species which are at present only known to the writer by the original figure and description, both of which are accordingly reproduced.

"Alæ supra nigræ, velut in *D. Horsfieldio*\* cinereo plagiatae et maculatæ; posticæ macula subcostali apud basin

aureo-flava; maculis quatuor discalibus et uno apicali albidis; area abdominali albicante (haud flavo maculata); corpus nigrescens, antennis nigris; alæ subtus fere velut in *D. Horsfieldio*, maculis posticarum multo minoribus, latius separatis: corpus cinereum, abdomine albicante, antennis nigris, cinereo squamosis: exp. alar. unc. 3, lin. 8½."

HAB.—Malay Peninsula; "Penang (colls. Brit. Mus. & W. W. Saunders)."

This is another differentiated or local race of an Indian species, the *D. belladonna*, Fabr.

#### 5. *Delias hyparete*, var. *metarete*. (Tab. XXIV., figs. 13 ♂, 14 ♀.)

*Papilio Hyparete*, Linnæus, Mus. Ulr. p. 247 (1764); Syst. Nat. i. 2, p. 763, n. 92 (1767).

*Delias metarete*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 1 (1877).

Male.—Wings above greyish-white; anterior wings with the neuration blackish, the apical third dusted with blackish, and with a series of marginal black spots at the apices of the nervules; posterior wings with the apices of the nervules and the outer margin irregularly blackish, the red submarginal spots beneath giving a roseate tint above. Anterior wings beneath as above, but with the apical blackish area more broken, and containing a series of five greyish-white spots. Posterior wings beneath greyish-white, the neuration blackish, the inner area bright ochraceous, and with a submarginal series of large red spots, the largest towards anal angle, outwardly and somewhat broadly margined with black, and inwardly more narrowly and obscurely with the same colour from apex to the lower median nervule. Body above and beneath dark greyish; legs dark greyish, more or less streaked with blackish.

Female. *Form a.*—Anterior wings above more or less suffused with blackish, the cell and inner area from lower median nervule to margin being palest; five or six distinct, but obscure, greyish subapical spots. Posterior wings above, with the outer margin (not reaching apex of cell) broadly blackish, the

\* Synonymic with *D. belladonna*, Fabr., an Indian species.

red spots beneath being obscurely visible above; neuration of both wings broadly blackish. Wings beneath as in male, but with all the black markings larger and darker.

Female. *Form b.*\*—Resembling *form a*, but with the black suffusions above larger, and altogether covering the anterior wings and reaching the apex of the cell in posterior wings.

Exp. wings, ♂ and ♀, 72 to 80 millim.

HAB.—Malay Peninsula; Province Wellesley (colls. Dist. & Sauer); Malacca (Pinwill—Brit. Mus.—coll. Dist.); Singapore (Kerr—coll. Dist.).—Borneo (Brit. Mus.); Banjermassin (coll. Dist.).

The two forms of the female here described seem to negative the probability that we are dealing with anything but a simple variety of *D. hyparete*, more especially as in Bornean specimens in the writer's collection, Sarawak examples agree with the form found in the Peninsula, whilst others received from Banjermassin are almost inseparable from Javan *D. hyparete*.

## 6. *Delias singhapura*.

*Thyca Singhapura*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 353, n. 29, t. 7, f. 2 (1867).

*Delias Singhapura*, Butl. Proc. Zool. Soc. 1872, p. 33, n. 36; Druce, Proc. Zool. Soc. 1873, p. 355, n. 3.

“Male. Wings elongate; above white, the costal margin and the outer half of the uppers dusky, nearly black at the apex, and with an ill-defined inner edge; lower wings with a narrow interrupted black border behind, within which dusky patches of scales extend a short distance along the nervures. Beneath: upper wings white, the nervures of the upper half black-margined, the apex blackish, leaving a row of six distinct ovate white spots; lower wings bright yellow, the nervures black-bordered, and a rather broad black border round the hind margin enclosing a row of six whitish spots, the inner ones bifid, the outermost yellow-tinged.”

Exp. wings, “3½ inches.”

HAB.—Malay Peninsula; “Singapore (coll. Wallace).”—Borneo (Druce); Sarawak (Brit. Mus.).

This species has not been received by the writer, nor seen by him in any of the many collections examined, which have been formed in different parts of the Peninsula.

## 7. *Delias orphne*.

*Thyca Orphne*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 361, n. 56, t. 8, f. 2 (1867).

“Male. Above, white, with the base dusky; upper wings with a narrow black border from the apex to near the outer angle, the costa dusky, as well as the extremity of the cell, and a broad marginal band beyond as if smeared with black; the lower wings have a very narrow dusky edging behind. Beneath: the uppers have the base dusky, a broad patch at the end of the cell nearly black, and a broad dusky outer margin enclosing a row of six white spots, the two lower the largest; lower wings black, but nearly covered with chrome-



FIG. 100.—*Delias singhapura* ♂.



FIG. 101.—*Delias orphne* ♂.

\* This is represented by the figure (Tab. XXIV., fig. 14).

yellow, which covers the whole abdominal margin to the middle of the wing, beyond which are three large oval spots near the outer angle; another band of yellow crosses the lower half of the cell, and reaches up to the inner margin near the base of the wing."

Exp. wings, "2 $\frac{3}{8}$  inches."

HAB.—Malay Peninsula; "Malacca—Mount Ophir—(coll. Wall.)."

This, judging from Mr. Wallace's figure and description, is a very distinct species, and from its general absence in collections, appears to be a very scarce one. As Mount Ophir is given as the precise locality where the species was taken, it may probably be peculiar to that little—entomologically—known and worked district.

### Genus PRIONERIS.

*Prioneris*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 383 (1867); Butl. Cist. Ent. vol. i. p. 39 (1870);\* Moore, Lep. Ceyl. vol. i. p. 140 (1881).

Anterior wings somewhat elongately subtriangular; costal margin arched at base, the apex subacutely rounded; outer margin oblique, inner margin slightly concavely sinuate. Costal nervure extending to nearly two-thirds the length of costal margin; first subcostal nervule emitted near middle of cell, second at a short distance from first, third and fourth bifurcating at about two-thirds the length of third, third and fifth bifurcating at about one-fourth of the length of third from end of cell; upper disco-cellular nervule very oblique and longer than the lower; cell extending to more than half the length of wing, median nervules situate wide apart. Posterior wings somewhat elongately subovate; costal margin oblique to apex, which is broadly rounded; outer margin convex and slightly and irregularly sinuate. Precostal nervure curved outwardly; costal nervure convexly rounded; first subcostal nervule emitted near middle of cell, second midway between bases of the first and of the discoidal nervule; disco-cellular nervules oblique, the uppermost much the longest; first and second median nervules a little closer together than second and third; submedian nervure nearly straight; internal nervure recurved and reaching to about two-thirds the length of abdominal margin. Body somewhat large and robust; head and pronotum very hairy; palpi long, and clothed with very long hairs beneath; legs long; antennæ long, with a gradually thickened apical club.

*Costal margin of the anterior wings minutely serrated.*

This is a very distinct genus, both by its neuration and also by the peculiar character of the serration of the costal margin of the anterior wings, which is immediately discovered if the finger is passed from the apex towards the base. In colour and markings the species approximate towards those of *Delias*, or, as Mr. Wallace remarks, "seem to mimic" them, as in all the cases the species of *Delias* "are very abundant, and are weak, slow-flying insects, while the mimicking species of *Prioneris* are rare, and in all cases the pairs which resemble each other inhabit the same district, and they often are known to come from the same locality." †

*Prioneris* is a somewhat small genus, and its species are distributed from Continental India and Ceylon throughout the Indo-Malayan region. One species is found in the Malay Peninsula.

\* In describing this genus Mr. Butler has omitted one of the subcostal nervules to the anterior wings.

† Trans. Ent. Soc. ser. 3, vol. iv. p. 383 (1867).

1. *Prioneris clemante*. (Tab. XXIV., fig. 16 ♂.)

*Pieris clemante*, Doubleday, Ann. Nat. Hist. vol. xvii. p. 23 (1846); Moore, Proc. Zool. Soc. 1865, p. 758;

Druce, Proc. Zool. Soc. 1873, p. 354, n. 1.

*Prioneris clemante*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 385, n. 4 (1867); Moore, Proc. Zool. Soc. 1878, p. 839.

*Pieris Berenice*, Luc. Rev. Zool. 1852, p. 324.

*Pieris Helfer*, Feld. Reise Nov. Lep. ii. p. 161, n. 131, t. 25, f. 10, 11 (1865).

Male. Wings above greyish-white; anterior wings with the neuration (widely broadened towards apex and outer margin) black, the costal and apical areas and outer margin powdered with blackish; posterior wings with the neuration only blackened on outer third, the posterior margin blackish. Anterior wings beneath as above, the cell either immaculate as in the specimen figured, or sometimes containing two or three longitudinal blackish lines; posterior wings with the whole of the neuration black, a bright red basal spot, the whole disk yellow, the apex and the area beyond cell between the upper subcostal and the second median nervules greyish-white, the outer margin broadly blackish towards anal angle, sometimes continued to apex by a narrow submarginal fascia, which is absent in the specimen figured. Body above more or less concolorous with wings; thorax beneath and legs blackish; abdomen beneath greyish white.

Exp. wings, ♂, 70 to 85 millim.

HAB.—Continental India; Bengal (Moore).—Burma; Moulmein (Felder).—Tenasserim; Houngduran source, Nathoung to Paboga (Limborg—Moore).—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Künstler—Calc. Mus.); Malacca (Biggs—coll. Dist.).—Borneo (Druce).

The females of this genus are exceedingly scarce, and I have not seen that of this species.

## Genus CATOPSILIA.

*Catopsilia*, Hübner, Verz. bek. Schmett. p. 98 (1816); Butl. Lep. Exot. p. 154 (1873); Moore, Lep. Ceyl. vol. i. p. 121 (1881).

*Murtia*, Hübn. Verz. bek. Schmett. p. 98 (1816).

*Callidryas*, Trim. (nec Boisd.), Rhop. Afr. Austr. p. 67 (1861).

Anterior wings subtriangular; costal margin arched and convex, outer margin oblique, inner margin slightly sinuate. Costal nervure arched and extending beyond middle of costal margin; first subcostal nervule emitted at about middle of cell, second from near end of cell, third and fourth bifurcating at about two-thirds the length of third, fifth bifurcating from third at about one-third beyond cell; disco-cellular nervules oblique, both somewhat concavely bent inwardly; discoidal nervule emitted from about their middle; first and second median nervules with their bases slightly nearer to each other than those of second and third. Posterior wings broadly subovate, costal and outer margins convex, the abdominal margins obliquely divergent at anal angles. Costal nervure arched and not quite reaching apex of wing, subcostal nervules bifurcating at about one-fourth before end of cell, disco-cellulars oblique, the lowermost the longest and slightly bent inwardly; upper median nervule from end of cell, the bases of the first and second about one-fourth nearer together than those of second and third; submedian nervure nearly straight, very slightly curved; internal nervure slightly curved. Body stout, pronotum hairy; palpi porrect, projecting one-third beyond the head, second joint laterally compressed; legs slender; antennæ gradually thickened into an apical club, which is truncate at tip.

Male with a tuft of silky hairs near base of inner margin of anterior wings, and with a glandular patch of raised scales above the subcostal nervure of the posterior wings.

This genus until quite recently was better known under the name of *Callidryas*, and embraced a number of American species as well as those of the Old World. Subsequent and more careful examination has shown that the butterflies of these areas are generically quite distinct, the peculiarity in neuration of the wings being sufficient to easily separate them. The Old World species are thus grouped under Hübner's genus *Catopsilia*, and are found in Western, Southern and Eastern Africa, Madagascar and the African Islands, Continental India, the Malay Peninsula, throughout the Malayan Archipelago, and also in Australia and New Zealand.

The species of *Catopsilia* are usually very abundant and gregarious, and notices of their habits have already been given under the generic name of *Callidryas* (*antea*, pp. 284-5).

### 1. *Catopsilia crocale*. (Tab. XXV., fig. 11 ♂, 12 ♀.)

*Papilio Crocale*, Cramer, Pap. Exot. i. t. 55, C, D (1779).

*Papilio Jugurtha*, Cram. Pap. Exot. ii. t. 187, E, F (1779).

*Papilio Alcmeone*, Fabr. (nec. Cram.), Ent. Syst. iii. p. 196, n. 611 (1793).

*Colias Jugurthina*, Godt. Enc. Méth. ix. p. 96, n. 21 (1819).

*Callidryas crocale*, Boisd. Sp. Gén. i. p. 625, n. 19 (1836); Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 400, n. 7 (1867); Butl. Lep. Ex. p. 22, t. 9, f. 1, 2, 3, 6 (1870); Druce, Proc. Zool. Soc. 1873, p. 355, n. 1; *ibid.* 1874, p. 108, n. 2; Snell. Tijd. Ent. xix. p. 18, n. 66 (1876); *ibid.* xxi. p. 35, n. 134 (1878); Moore, Proc. Zool. Soc. 1878, p. 837.

*Catopsilia crocale*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 1 (1877); Moore, Proc. Zool. Soc. 1877, p. 591; *ibid.* 1882, p. 253; Lep. Ceyl. vol. i. p. 122, t. 48, f. 1, 1a, b (1881); Wood-Mas. and de Nic. J. A. S. Beng. vol. xlix. p. 236, n. 60 (1880); de Nic. J. A. S. Beng. vol. li. p. 63, n. 188 (1882); Kheil, Rhop. der Insel. Nias, p. 35, n. 134 (1884).

*Colias Alcmeone*, Horsf. Cat. Lep. E. I. C. p. 131 (1829).

*Callidryas Alcmeone*, Horsf. & Moore, Cap. Lep. Mus. E. I. C. vol. i. p. 57, t. 1, f. 7, 7a (1857).

Var. ♀. *Callidryas Endeer*, Boisd. Voy. Astr. Lep. p. 63, t. 2, f. 3, 4 (1832).

Male. Wings above very pale greenish-white; anterior wings with the costal and outer margins—broadest at apex and not reaching the outer angle—dark fuscous; the basal third of wing and costal area to a little beyond end of cell sulphur-yellow; posterior wings with the inner half—concave externally—sulphur-yellow. Wings beneath pale stramineous, with an ochraceous tinge; anterior wings with the lower half—beneath cell and extending to outer margin—pale greenish-white. Body above with the pronotum dark and thickly covered with long pale greenish hairs, the abdomen pale ochraceous, eyes castaneous, body beneath with legs more or less concolorous with wings.

Female. Wings above greenish-white or pale sulphureous, both wings with the basal areas more or less suffused with darker sulphureous or pale ochraceous as in male. Anterior wings with the costal and outer margins broadly and irregularly dark fuscous, broadest at apex, where there is a more or less distinct subapical fascia enclosing some pale apical spots; a dark fuscous spot at end of cell sometimes connected with the dark costal margin. Posterior wings above with the outer margin broadly and irregularly dark fuscous, sometimes having some faint and obscure pale fuscous submarginal markings. Wings beneath as in male, but darker, with one small disco-cellular spot on anterior wings and two on posterior wings.

Exp. wings, ♂, 52 to 68 millim.; ♀, 70 to 78 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—Moore); Darjeeling, Punjab, Nepal (Butler); Madras Coast (Brit. Mus.); Bombay (Leith—coll. Dist.).—Ceylon (Moore).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Nicobar Islands; Kamorta (Moore).—Burma; Moulmein (Brit. Mus.).—

Tenasserim: Moolai to Meetan (Limborg—Moore).—Malay Peninsula; Province Wellesley (colls. Dist. and Saüer); Malacca (Pinwill—Brit. Mus.).—Siam; Chentaboon, Naheonchaisee (Druce).—Hong Kong (Butler).—Sumatra (Wallace).—Nias Island (Kheil).—Java (Horsfield).—Borneo (Lowe—coll. Dist.).—Lombok (Butler).—Philippine Islands (Wallace).—Celebes (Snellen).—Batchian, Ceram, Timor (Wallace).—Australia; Queensland (Wallace); Moreton Bay (Brit. Mus.).

Although this is such a widely distributed species, I did not find it unusually abundant in the Malay Peninsula. In Ceylon Capt. Hutchison reports that it is found “everywhere. Plains and hills up to 6000 feet, in forest and cultivated land. Have taken them at almost all times. Flight strong, quick, sits in crowds on damp spots of roadside.”\* Capt. de la Chaumette observed it frequenting the gardens at Saugor, and states that it is “very fond of flying about the outside branches of the ‘Babool’ (*Acacia arabica*)”; and that it is “on the wing from July to November.”† Capt. A. M. Lang writes that “this species frequents *Cathartocarpus fistula*, an introduced plant in gardens of the North Indian plains, but indigenous to the lower slopes of the Himalayan ranges, 2000 to 5000 feet.”‡

## 2. *Catopsilia catilla*. (Tab. XXV., figs. 16 ♂, 15 ♀.)

*Papilio Catilla*, Cramer, Pap. Ex. iii. t. 229, D, E (1782).

*Papilio Hilaria*, Cram. Pap. Ex. iv. t. 339, A, B (1782).

*Papilio Titania*, Fabr. Ent. Syst. Suppl. p. 428 (1798).

*Callidryas Phlegæus*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 401, n. 8 (1867).

*Callidryas Hilaria*, Boisid. Sp. Gén. i. p. 626, n. 20 (1836); Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 400, n. 6 (1867).

*Colias Catilla*, Godt. Enc. Méth. ix. p. 95, n. 20 (1819).

*Colias Hilaria*, Godt. ib. p. 96, n. 25 (1819).

*Colias Titania*, Godt. ib. p. 97, n. 26 (1819).

*Callidryas Catilla*, Butl. Lep. Ex. p. 24, t. 9, f. 7–10 (1870); Druce, Proc. Zool. Soc. 1873, p. 355, n. 2; Moore, Proc. Zool. Soc. 1878, p. 837; Godm. & Salv. Proc. Zool. Soc. 1878, p. 640, n. 24.

*Catopsilia catilla*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 2 (1877); Moore, Proc. Zool. Soc. 1877, p. 591; ib. Lep. Ceyl. vol. i. p. 122 (1881); Enys, Cat. Butt. New Zeal. p. 17, n. 14 (1880); Wood-Mas. & de Nic. J. A. S. Beng. vol. L. p. 251, n. 87 (1881); de Nic. J. A. S. Beng. vol. li. p. 63, n. 187 (1882).

Male. Wings above pale greenish-white. Anterior wings with the costal margin narrowly dark fuscous, the apex a little more broadly so of the same colour, and the outer margin as far as the middle median nervule also narrowly but irregularly dark fuscous; basal area—occupying nearly half of cell and extending to inner margin—and costal area from base to a little beyond middle of cell, bright sulphur-yellow. Posterior wings with the basal third—becoming narrower and paler towards anal angle—bright sulphur-yellow. Wings beneath greenish-white, sometimes with an ochraceous tinge; anterior wings with a small reddish disco-cellular spot at end of cell, and sometimes a reddish narrow angulated fascia between end of cell and outer margin; apex and outer margin narrowly pale reddish; posterior wings with two reddish disco-cellular spots at end of cell—these have pearly centres and sometimes have an outer encircling ring. Body above with the pronotum dark and covered with long greenish hairs, the abdomen ochraceous, the eyes castaneous: body beneath and legs more or less concolorous with wings.

\* Moore's Lep. Ceyl. vol. i. p. 123.

† Ent. Month. Mag. vol. ii. p. 36.

‡ Ibid. vol. i. p. 103.

Female. Wings above dark sulphureous; anterior wings with the costal margin commencing about one-third from base—narrowly—and the apex and outer margin—broadly and irregularly—dark fuscous; a fuscous spot at end of cell, and a more obscure, angulated, transverse fascia between end of cell and outer margin; posterior wings with the outer margin spotted with fuscous. Wings beneath ochraceous, the disco-cellular spots as in male; the anterior wings with the apex and outer margin somewhat broadly pale reddish, and with a distinct pale reddish angulated transverse fascia between end of cell and outer margin; posterior wings with a transverse linear reddish spot between the costal nervure and the first subcostal nervule, and an outer discal, waved, pale reddish, transverse fascia: marginal spots much smaller than above.

♀. Var. *a*.—Wings beneath with the disco-cellular spots much larger and darker, the linear spot between the costal nervure and first subcostal nervule of the posterior wings also much larger and darker.

♀. Var. *b*.—Anterior wings beneath with the disco-cellular spot surrounded by a large dark dull reddish patch, the discal transverse fascia also broader and dull dark reddish. Posterior wings beneath with a very large discal, dull and dark reddish patch extending from costal nervure to upper median nervule; this patch occupies outer third of cell and is inwardly and outwardly much angulated and is continued beneath the upper median nervule by a narrow fascia becoming obsolete towards abdominal margin.

Exp. wings, ♂, 75 to 80 millim.; ♀, 58 to 80 millim.

HAB.—Continental India; Silhet (Brit. Mus.); Sikkim (de Nic.); Bengal, Nepal, Calcutta (Butler).—Ceylon (Moore).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Burma; Moulmein (Butl.).—Tenasserim; Hatsiega to Houngduran; Naththoung to Paboga; Moolai (Limborg—Moore).—Malay Peninsula; Penang (coll. Dist.); Province Wellesley (colls. Säuer & Dist.); Perak (Künstler—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.).—Billiton Island (Godm. & Salv.).—Java (coll. Dist.).—Borneo (Druce).—Philippine Islands (Wallace).—Celebes, Moluccas, Timor (Wallace).—Australia; Queensland (Butler); Brisbane (coll. Dist.); Rockingham Bay, Moreton Bay (Brit. Mus.).—New Zealand (Enys).

The females of this species are eminently variable, both as regards the size of the spots and the presence of the dark patches on the under surface of the wings; the commonest form is the one here figured. In North-West India, according to Capt. Lang, this butterfly frequents the *Cathartocarpus fistula*, as does the previous species *C. crocale*.\* In Ceylon Capt. Hutchison reports this species as being “at all times very local. Found in several spots of limited extent; and always there.”† It is also, in the same habitat, a remarkably migratory species, Mr. Mackwood stating that “In the flights along the sea-coast, beginning generally in November, this species of *Catopsilia* forms about a third of the number, always travelling to the north; the flights lasting for days, thousands of them passing in an hour.”‡

### 3. *Catopsilia scylla*. (Tab. XXIV., figs. 1 ♂, 2 ♀.)

*Papilio Scylla*, Linnæus, Mus. Utr. p. 242 (1764); Syst. Nat. i. 2, p. 763, n. 95 (1767); Joh. Amæn. Acad. vi. p. 404, n. 57 (1764); Houtt. Nat. Hist. i. 11, p. 256, t. 88, f. 5 (1767); Müll. Naturs. v. 1, p. 592, n. 95, t. 18, f. 5 (1774); Meerb. Afbeeld, t. 16, (1775); Cram. Pap. Ex. i. t. 12, C, D (1775); Sulz. Gesch. Ins. p. 143, t. 15, f. 6 (1776); Gmel. Syst. Nat. i. 5, p. 2268, n. 95 (1790); Herbst, Naturs. Schmett. v. p. 198, n. 105, t. 111, f. 5, 6 (1792); Don. Ins. Ind. t. 28, f. 3 (1800); Turt. Syst. of Nat. iii. 2, p. 72 (1806).

\* Ent. Month. Mag. vol. i. p. 103.

† Moore's Lep. Ceyl. vol. i. p. 122.

‡ Ibid.



*Colias Scylla*, Hübn. Verz. bek. Schmett. p. 99, n. 1050 (1816); Godt. Enc. Méth. ix. p. 95, n. 19 (1819); Horsf. Cat. Lep. E. I. C. p. 133, n. 59 (1829).

*Callidryas Scylla*, Boisd. Sp. Gén. i. p. 631, n. 25 (1836); Luc. Lep. Exot. p. 80, t. 40, f. 1 (1845); Horsf. and Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 58, n. 102 (1857); Voll. Faun. Ind. Néerl. Pier. p. 62, n. 4 (1865); Butl. Lep. Exot. p. 31, n. 6, t. 12, f. 5—8 (1870); Snell. Tijd. Ent. xix. p. 18, n. 64 (1876); *ibid.* xx. p. 2 (1877); *ibid.* xxi. p. 35, n. 133 (1878); Lep. v. Midden. Sumatra, p. 23, n. 2 (1880).

*Catopsilia Scylla*, Kirby, Cat. Diurn. Lep. p. 486, n. 28 (1871); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 4 (1877); Aurivill. Kongl. Sv. vet. Akad. Handl. Bd. 19, no. 5, p. 55 (1882).

*Papilio Cornelia*, Fabr. Mant. Ins. ii. p. 21, n. 229 (1787).

Var. *Callidryas Gorgophone*, Doubl. & Hew. (nec. Boisd.), Gen. Diurn. Lep. t. 9, f. 2 (1847).

Var. *Callidryas Etesia*, Hewits. Ex. Butt. iv. *Call.* t. 1, f. 5, 6 (1867).

Male. Anterior wings above pale greenish-white; costal margin—very narrowly—and apex and outer margins—broadly—dark fuscous. Posterior wings above bright ochraceous, with some scattered small and obscure fuscous marginal spots. Wings beneath dark sulphureous; anterior wings with the internal area—beneath cell and lower median nervule—pale greenish-white; a duplex pale castaneous spot at end of cell, a waved and broken pale castaneous fascia between end of cell and outer margin, and the apex and outer margin of somewhat the same colour; posterior wings with two small pale castaneous spots at end of cell, followed by an outer discal waved and broken pale castaneous fascia, and with small dark marginal spots as above. Body above greyish-white, the pronotum clothed with pale greenish hairs; abdomen beneath greyish-white; thorax and legs ochraceous; eyes dark castaneous.

♂. Var. *a.*—Anterior wings above with the apex, costal and outer margins very pale brownish; wings beneath with the discal fasciæ almost obliterated.

Female. Anterior wings above as in male, but with the apex and margins more broadly and irregularly dark fuscous, and with a narrow, angulated, macular fascia between end of cell and outer margin. Posterior wings paler ochraceous than in male, the dark marginal spots very large and with faint indications of a dark macular fascia between end of cell and outer margin. Wings beneath as in male, but with all the markings broader and darker, and with some additional spots near base of posterior wings.

Exp. wings, ♂ and ♀, 57 to 75 millim.

HAB.—Malay Peninsula; Province Wellesley (colls. Sauer & Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.).—Sumatra (Snellen).—Java (Horsf.); Batavia (Snellen).—Lombok; Timor (Wallace).—Celebes (coll. Dist.).—Ternate, Batehian (Wallace).—Australia; Champion Bay (Boulay—Brit. Mus.); Port Essington (Brit. Mus.).

This is a variable species, and the figures here given represent the form existing in the Malay Peninsula, which certainly does not reach the maximum of size and coloration as found elsewhere.

The larva and pupa, as found in Java, have been figured by Dr. Horsfield,\* who states that the larva “feeds on various species of *Cassia*, particularly on the *Cassia fistula* and *C. obtusifolia*.” “It is, however, occasionally found on other plants; it is extremely abundant, particularly in the early part of the rainy season, after the renewal of the foliage of these plants.” †

\* Cat. Lep. E. I. C. t. iv. f. 6, 6a.

† *Ibid.* p. 134.

4. *Catopsilia chryseis*. (Tab. XXV., fig. 2 ♂, 1 ♀; Tab. XXVI., fig. 20 ♀ *var.*)

*Papilio Chryseis*, Drury, Ill. Ex. Ent. i. t. 12, f. 3, 4 (1773).

*Papilio Aleyone*, Cram. Pap. Ex. i. t. 58, A—C (1779).

*Callidryas Chryseis*, Butl. Lep. Ex. i. p. 35, n. 8, t. 15, f. 4—7 (1870).

*Catopsilia Chryseis*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 3 (1877); Proc. Zool. Soc. 1877, p. 813, n. 28; Moore, Proc. Zool. Soc. 1877, p. 591; Lep. Ceyl. vol. i. p. 125 (1881).

*Callidryas pyranthe*, Wall. (nec. Linn.), Trans. Ent. Soc. ser. 3, vol. iv. p. 400, n. 3 (1867).

Male. Wings above pale greenish-white; anterior wings with the costal margin—very narrowly—and the apex and outer margin—not reaching outer angle—dark fuscous; a dark fuscous spot at end of cell; posterior wings with some very minute and obscure marginal spots. Wings beneath pale greenish ochraceous, thickly covered with darker strigæ, which form an indistinct fascia on both wings between end of cell and outer margin; anterior wings with the inner area occupying lower half of cell and extending to outer margin, pale greenish-white, both wings with a small brownish spot at end of cell. Body above with the pronotum dark and covered with long greenish-white hairs, the abdomen obscure ochraceous, eyes castaneous, body beneath and legs more or less concolorous with wings.

Female. Resembling the male above, but with the costal margin more broadly fuscous, and with a short subapical fuscous fascia, apparently enclosing two or three pale spots; posterior wings with a distinct marginal series of brownish spots. Wings beneath generally as in male.

Female. *Var. a.*—Anterior wings above with the fuscous apex and subapical fascia amalgamated; posterior wings with the outer margin broadly and irregularly dark fuscous.

Exp. wings, ♂ and ♀, 60 to 66 millim.

HAB.—Continental India; Assam, Bengal (Brit. Mus.).—Ceylon (Moore).—Andaman Islands; Port Blair (Moore).—Burma; Moulmein (Brit. Mus.).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.).—Sumatra (Wallace).—Java; Bantam (coll. Dist.).—Flores (Wallace).—Philippine Islands; Manilla (Brit. Mus.).—Formosa (Brit. Mus.).—Australia; Port Stephen, Queensland (Brit. Mus.).

The females of this species vary considerably in the amount of the dark fuscous marginal shadings on the upper surface of the wings.

## Genus UDAIANA.

*Udaiana*, Distant, *antea*, p. 286.

Anterior wings subtriangular, the costal margin arched at base, and then somewhat oblique to apex; apex obtuse; outer margin convex; inner margin nearly straight, very slightly sinuate. Costal nervure terminating on costa a little beyond apex of cell; first and second subcostal nervules emitted somewhat close together near end of cell, third and fourth bifurcating near apex of wing, fourth and fifth bifurcating almost midway between end of cell and apex of wing; upper disco-cellular nervule obliquely concave near its upper end, lower oblique and slightly bent inwardly; median nervules about equally wide apart, upper from end of cell. Posterior wings somewhat elongately subovate; costal margin obliquely rounded to apex; outer margin convex; abdominal margins obliquely divergent at anal angle. Costal nervure rounded, extending to a little more than half the length of costal margin; subcostal nervules bifurcating at about one-third before end of cell; disco-cellular nervules oblique, the upper slightly bent inwardly; upper median nervule from end of cell; bases of the first and second median nervules about one-fourth nearer together than those of second and third; submedian nervure nearly straight; internal nervure

directed inwardly. Body moderately robust; pronotum hairy; palpi long, porrect, projecting beyond the head, the second joint very longly hirsute; antennæ moderately long, with a short but well-thickened apical club; legs long and slender.

The position of the first and second subcostal nervules of the anterior wings have compelled the erection of a new genus for the reception of the *Pieris cynis*, Hewits. *Udaiana* has a superficial resemblance to some species of *Appias* and *Belenois*, and with the last genus it has been sometimes incorporated.

### 1. *Udaiana cynis*. (Tab. XXVI., figs. 5 ♂, 6 ♀.)

*Pieris cynis*, Hewitson, Ex. Butt. iii. *Pier.* t. 8, f. 54 (1866); Wall. Trans. Ent. Soc. ser. iii. vol. iv. p. 341. n. 41 (1867).

*Phrissura cynis*, Butl. Cist. Ent. vol. i. p. 49 (1870).

*Belenois cynis*, var., Butl. Trans. Ent. Soc. 1871, p. 171.

*Belenois cynis*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 1 (1877).

Male. Wings above pale greenish-white; anterior wings with the basal half of costal area dark greyish, speckled with black; remainder of costal area, the apex—broadly—and the outer margin—angulated internally—black; posterior wings with some small black spots on outer margin. Anterior wings beneath as above, but with the black markings paler; posterior wings beneath without the black marginal spots. Body above fuscous, beneath with legs more or less concolorous with wings.

Female. Anterior wings above fuscous, with an outer discal curved fasciate series of large whitish spots; posterior wings above greyish-white, with the base and outer marginal area fuscous. Anterior wings beneath as above, but with the white markings rather larger; posterior wings beneath as above, sometimes with a faint central transverse narrow fuscous fascia.

Exp. wings, ♂ and ♀, 50 millim.

HAB.—Malay Peninsula; Perak (Künstler—Calc. Mus.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Ayerpanas (Godfery—coll. Dist.).—Sumatra (Hewits.).

This species has a close ally in North Borneo, of which I append description.\*

The dissimilarity of the sexes in this species affords a good example of what is generally found more or less throughout this subfamily. Mr. Darwin, as is well known, sought the explanation in his theory of "sexual selection." Dr. Weismann, on the contrary, considered the formation of these secondary sexual characters to be "due in great part to the difference of physical constitution between the sexes." †

\* *Udaiana pryeri*, n. sp. Male.—Wings above closely resembling those of *U. cynis*; anterior wings beneath with the basal costal area somewhat broadly fuscous; posterior wings beneath with the basal fourth also fuscous, and with some indistinct narrow discal fuscous markings.

Exp. wings, 55 millim.

HAB.—Borneo; Sandakan (Pryer).

† 'Studies in the Theory of Descent,' Eng. transl. p. 62.

## Genus TERIAS.\*

*Terias*, Swainson, Zool. Illustr. i. t. 22 (1820-21); Horsk. Cat. Lep. E. I. C. p. 134 (1829); Boisd. Spec. Gén. i. p. 651 (1836); Doubl. Gen. Diurn. Lep. p. 76 (1847); Butl. Cist. Ent. vol. i. p. 44, n. 16 (1870); Moore, Lep. Ceyl. vol. i. p. 118 (1881).

Anterior wings subtriangular, apex generally more or less rounded, costal margin rounded and arched at base, outer margin more or less oblique, inner margin sinuate. Costal nervure terminating on costa a little beyond end of cell; first subcostal nervure emitted at about one-fourth before end of cell, second very near end of cell, third and fourth bifurcating about midway between end of cell and apex of wing, third and fifth bifurcating beyond cell at about one-third the distance between end of cell and apex of wing; upper disco-cellular nervule shorter than the lower, which is concave, with its lower half directed outwardly; discoidal nervule emitted at the junction of the disco-cellulars; cell broad and extending to about half the length of wing; upper median nervule somewhat convexly bent and emitted from end of cell, second with its base about half the distance from that of first as from that of third. Posterior wings broadly subovate, costal margin obliquely convex, outer margin rounded. Precostal nervure more or less atrophied; costal nervure arched and almost reaching apex of wing; subcostal nervules bifurcating close to end of cell; disco-cellular and median nervules arranged much as in anterior wing. Body slender; pronotum hairy; palpi short, scarcely extending beyond the head, second joint broadly compressed, third joint minute and pointed; legs slender; antennæ with a gradually formed apical club.

This genus is almost universally distributed throughout the tropical and subtropical portions of the world; and this is easily understood when we reflect on the migratory habits of so many observed species. In the East the species are, as a rule, of some shade of orange-yellow, with black apical and marginal markings. In the Neotropical region many species have the ground-colour white, instead of yellow, and this hue is also found in some African and Oriental species.

By the general consent of all who have worked at this genus, it is agreed that the discrimination or separation of the species affords the greatest difficulty. This is owing to the extreme variability of the species, and to the disinclination of some cabinet entomologists to admit the same, or at least with the adequacy necessary to meet these difficulties. A good example of this has been afforded by the treatment accorded to some Japanese specimens. *T. hecabe* and *T. mandarina* are two so-called species, which, taken in their typical forms, would scarcely leave a doubt as to their being thoroughly distinct and good species. In 1880 Mr. Butler published a paper in which he stated that, by the aid of 154 specimens received from Nikko, he had "been able to arrange a perfect gradational series of scarcely differing forms, from the most heavily-bordered of the Japanese representative of *T. hecabe* to the palest *T. mandarina*, in which the border has practically disappeared." Mr. Butler, however, did not conclude from this that *T. hecabe* and *T. mandarina* are but extreme forms of one species, but suggested a theory of "hybridization," and described three of the series under new specific names.† Subsequent to this paper Mr. H. Pryer, an entomologist with the advantage of

\* Mr. Kirby (Syn. Cat. Diurn. Lep. p. 441) has substituted Hübner's earlier published name *Eurema* for this genus, which seems strictly correct; but as there appears to be a consensus among lepidopterists to use the better known, and generally accepted, name *Terias*, I have followed that course here, which, though eminently reasonable and conducive to the study of the butterflies, as against that of generic words, is still scarcely logical and in keeping with the method pursued by myself elsewhere.

† Trans. Ent. Soc. 1880, pp. 197-200.

residing in Japan, has by careful breeding proved that *T. hecabe* and *T. mandarina* are one species, or rather what Mr. Pryer calls "temperature forms" of one species, and he accounts for the fact of breeding so many intermediate forms from one batch of eggs by the qualifying conditions of "having reared these specimens in a cold room, without much direct sunlight."\* Neotropical species afford the same difficulty, and that excellent naturalist, Mr. Bates, has supplemented his account of those of the Amazon Valley by a "note" stating that "the species of *Terias* are a most difficult study, and it is with some hesitation that I have described several as new." He further remarks:—"Their specific characters are not at all trenchant; the peculiar markings which may serve to distinguish well-characterised examples of a species are subject to become obsolete in other examples; the species, again, present many local varieties in different parts of their area of distribution."† I fully entertain this view with regard to the species or varieties found in the Malay Peninsula, and where I have been unable to find a published name for any species have refrained from giving it a new one, preferring to have that done by some local lepidopterist who could give certitude to his work by breeding the different forms.

The Rev. L. C. Biggs writes:—"These butterflies are often seen by dozens together in moist places on the road, or singly near the Malay villages, under the shade of cocoa-nut trees, or crowding round the inky pools too often found in closest proximity to the Malays' dwellings. They, with the smallest *Lycenidae* and the Skippers, are among the first to venture out in the morning after heavy dew, or at any time after a storm."‡

### 1. *Terias tilaha*. (Tab. XXV., fig. 8 ♂.)

*Terias Tilaha*, Horsfield, Cat. Lep. E. I. C. p. 136, n. 62 (1829); Boisd. Spec. Gén. i. p. 668, n. 26 (1836); Voll. Mon. Pier. p. 65 (1865); Wall. Trans. Ent. Soc. ser. iii. vol. iv. p. 326, n. 27 (1867); Butl. Proc. Zool. Soc. 1871, p. 537, n. 64.

Male. Wings above bright sulphureous; anterior wings with the costal margin narrowly, the apex and outer margin broadly, and the inner margin also broadly, black (the apical and outer marginal black area is inwardly oblique and dentately sinuate, occupying about half the distance between end of cell and apex of wing, and terminating somewhat narrowly at the outer angle). Posterior wings with the outer margin somewhat broadly black and inwardly obscurely sinuate. Wings beneath less brilliant sulphureous than above; anterior wings with a curved black line near base of cell, two connected disco-cellular black lines at end of cell, and a fainter curved narrow blackish fascia near apex; posterior wings with one or two small blackish spots near base, two connected disco-cellular blackish lines at end of cell, a submarginal series of small blackish spots, preceded on the costa by a larger and darker one, and a series of small but dark marginal spots placed between the nervules. Body above black, beneath with legs sulphureous, tarsi infuscated.

Exp. wings, ♂, 43 to 46 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Künstler—Calc. Mus.).—Java (Horsf.).—Borneo (Voll.); Sandakan (Pryer—coll. Dist.).

I have not received the female of this species, which is probably paler in hue than the male, and with the blackish margins broader.

\* Trans. Ent. Soc. 1882, pp. 488-9. In recording the *fact* of Mr. Pryer's breeding the writer does not accept Mr. Pryer's further *proposition*, that Australian, West African, and other described species, should also be considered as varieties of *T. hecabe*, or rather should, in defiance of all canons of nomenclature, be called under a new name.

† Journ. Entomology, i. p. 245 (1861).

‡ Month. Packet, vol. ii. p. 187 (1881).

2. *Terias hecabe*. (Tab. XXVI., fig. 19 ♂.)

*Papilio Hecabe*, Linnæus, Syst. Nat. ed. x. p. 470, n. 74 (1758); ib. ed. xii. p. 763, n. 96 (1767); Clerck, Icones Ins. iii. (ined.) t. 6, f. 4, a, b (1764); Fabr. Syst. Ent. p. 472, n. 125 (1775); Spec. Ins. ii. p. 42, n. 178 (1781); Sulz, Gesch. Ins. p. 143, t. 15, f. 7 (1776); Cram. Pap. Exot. ii. p. 40, t. 124, B, C (1779); Gmel. Syst. Nat. i. 5. p. 2269, n. 96 (1790); Herbst, Naturs. Schmett. v. p. 171, n. 82, t. 106, f. 3, 4 (1792).

*Eurema Hecabe*, Hübn. Verz. bek. Schmett. p. 96, n. 1022 (1816); Aurivill. Kongl. sv. vet. Akad. Handl. Band. 19, no. 5, p. 60 (1882).

*Pieris Hecabe*, Godt. Enc. Méth. ix. p. 134, n. 51 (1819).

*Terias Hecabe*, Swains. Zool. Ill. i. t. 22 (1820); Horsf. Cat. Lep. E. I. C. p. 135, n. 60, t. 1, f. 12 (1829); Boisd. Spec. Gén. i. p. 669, n. 27 (1836); Luc. Lep. Exot. p. 75, t. 38, f. 2 (1845); Butl. Proc. Zool. Soc. 1870, p. 727, n. 1; ib. 1871, p. 536, n. 59; ib. 1874, p. 286, n. 71; Moore, Proc. Zool. Soc. 1878, p. 836; Lep. Ceyl. vol. i. p. 118, t. 45, f. 1 a, b, c (1881); Snell. Tijd. Ent. xix. p. 18, n. 67 (1876); ib. Lep. v. Midden-Sumatra, p. 23, n. 1 (Leiden, 1880); Wood-Mas. & de Nic. J. A. S. Beng. vol. xlix. p. 235, n. 56 (1880); ib. vol. L. p. 236, n. 49 (1881); Elwes, Proc. Zool. Soc. 1881, p. 881.

*Terias hecabeoides*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 3 (1877); Moore, Lep. Ceyl. vol. i. p. 119, t. 45, f. 3, 3 a, b (1881).

*Terias multiformis*, Pryer (part), Trans. Ent. Soc. 1882, p. 489.

Male. Wings above bright sulphureous; anterior wings with the costal margin narrowly, and the apex and outer margin broadly, blackish; the outer black area is concavely and sinuately oblique to upper median nervule, then strongly deflected towards margin, slightly but distinctly angulately produced at second median nervule, and inwardly extending along inner margin for about one-fourth of its length; posterior wings with the outer margin blackish, which becomes evanescent towards the anal angle. Wings beneath somewhat less brilliant sulphureous than above; anterior wings with a small dusky spot near base of cell, and with two slender and connected angulated disco-cellular lines at end of cell; apical and outer margin minutely spotted with fuscous; posterior wings with three rounded dusky spots near base, two angulated and connected disco-cellular lines at end of cell, and some outer discal small dusky patches; posterior margin minutely spotted with fuscous. Body above blackish, beneath, with legs, more or less ochraceous; tarsi somewhat infuscated.

Female. Paler sulphureous than the male, the dark markings also paler and somewhat broader.

Exp. wings, ♂ and ♀, 35 to 50 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—Moore); Bombay (Leith—coll. Dist.); Gujerat (Brit. Mus.); Silhet (Brit. Mus.); Sikkim (de Nicéville).—Ceylon (Thwaites—coll. Dist.).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Nicobar Islands; Katschall, Trinkut, Nankowri (Wood-Mas. and de Nic.).—Burma; Moulmein (Brit. Mus.).—Tenasserim; Meetan; Hatsiega; Naththoung to Paboga (Limborg—Moore).—Malay Peninsula; Penang, Province Wellesley (coll. Dist.); Sungei Ujong (Biggs—coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.).—Siam; Nahcone-haisee (Druce).—Sumatra (Snellen).—Nias Island (Kheil).—Billiton (Godm. & Salv.).—Java (Horsf.); Batavia (Snellen); Bantam (coll. Dist.).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).—Celebes (coll. Dist.).—Formosa (Brit. Mus.).—China, Japan (Elwes).—Aru Islands ('Challenger' Exped.).—New Guinea (Godm. & Salv.).—New Ireland (coll. Dist.).—Australia; Cape York (Brit. Mus.); Port Essington, Rockingham Bay (Brit. Mus.).—South Sea Islands; Vanua, Valava (Herr Schöff.).

Var. *a*. (Tab. XXVI., fig. 15 ♂, 11 ♀.)

More or less completely resembling typical form of *T. hecabe* above, but beneath with a more or less developed irregularly formed subapical fuscous streak to anterior wings, and the dark markings somewhat more numerous and better pronounced on posterior wings.

HAB.—Continental India; Bombay (Leith—coll. Dist.).—Malay Peninsula; Penang (coll. Dist.); Perak (Künstler—Calc. Mus.; Biggs—coll. Dist.); Sungei Ujong (Durnford—coll. Dist.).

This varietal form somewhat approaches the *T. asiopæ* of Menetries, and is intermediate between that form and typical *T. hecabe*. It seems impossible to come to any other conclusion than that this species is extremely variable; and this view is not only prompted by the extent of its geographical distribution, but has also been proved by the breeding experiments of Mr. Pryer in Japan (*antea*, p. 302).\* In my own opinion the following species (?), *T. sari*, should also be considered as a variety of *T. hecabe*, but as breeding experiments have not yet proved this to be the case (as I have little doubt will subsequently be demonstrated), I have kept them as distinct in a *classificatory* sense.

The larva and pupa, as observed in Java have been figured by Horsfield, † who describes the first as feeding on the "*Æschynomene sesban*," and as "found abundantly from January to April." ‡ In Ceylon, according to Dr. Thwaites, the larva feeds on *Leguminosæ*, and Mr. Mackwood gives the "Madras thorn" as the food-plant. §

### 3. *Terias sari*. (Tab. XXV., fig. 3 ♂.)

*Terias Sari*, Horsfield, Cat. Lep. E. I. C. p. 136, n. 61 (1829); Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 326, n. 25 (1867); Butl. Proc. Zool. Soc. 1871, p. 537, n. 63; Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 2 (1877); Druce, Proc. Zool. Soc. 1873, p. 354, n. 4.

*Terias Hecabe*, var. ♀, Boisd. Sp. Gén. i. p. 670 (1836).

Male. Wings above closely resembling those of *T. hecabe*, but the anterior wings beneath with a large apical fuscous subquadrate spot.

Female. Resembling the male, but paler sulphureous, and with the dark marginal markings paler and broader.

#### Var. *a*. (Tab. XXVI., fig. 3 ♂.)

Resembling typical form of *T. sari*, but with the subquadrate apical fuscous spot on the under surface of the anterior wings more or less cleft.

#### Var. *b*. (Tab. XXVI., fig. 7.)

Pale and dwarf form of the species.

Exp. wings, 34 to 52 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Künstler—Calc. Mus.); Malacca (Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.).—Sumatra (Wallace).—Java (Horsfield).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).—Flores, Timor, Australia? (Wallace).

As previously stated, the writer can see no improbability, but rather every possibility, that breeding will prove the *T. sari*, Horsf., to be only a variety of *T. hecabe*, Linn. The typical *sari*, as described by Horsfield, is the form figured (Tab. XXV., fig. 3). The dwarf form (Tab. XXVI., fig. 7) is not uncommon, as the British Museum also contains an example which was captured by Capt. Pinwill in Malacca.

\* I have not included in the synonymy all the named forms which Mr. Pryer found to be conspecific in Japan, as some of them do not appear to be found in this fauna.

† Cat. Lep. E. I. C. t. iv. f. 8, 8a.

‡ Ibid. p. 136.

§ Moore's Lep. Ceyl. vol. i. p. 119.

4. *Terias vallivolans*. (Tab. XXVI., fig. 17 ♂.)

*Terias vallivolans*, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xi. p. 420, n. 71 (1883).

This species or variety appears to differ only from *T. hecabe* by the narrower black marginal borders to the wings.\*

Exp. wings, 46 millim.

HAB.—Malay Peninsula; Singapore (Kerr—coll. Dist.).—Philippine Islands; Mindanao ('Challenger' Exped.).

The reason why the writer considers it probable that this is but another variety of *T. hecabe* is partly derived from the remarks of Mr. Butler himself, who describes *T. vallivolans* as "in pattern and coloration nearest to *Terias mariesii*, var. *e* (Trans. Ent. Soc., 1880, pl. vi., fig. 5), but with narrower wings, &c." Now as Mr. Pryer has stated that his breeding experiments have proved that *T. mariesii* and its varieties are together but seasonal forms of *T. hecabe*, † we must, if we credit Mr. Pryer, as certainly doubt that we are here dealing with *specific* differences.

5. *Terias pumilaris*, var. (Tab. XXVI., fig. 10 ♂.)

*Terias pumilaris*, Butler, Proc. Zool. Soc. 1875, p. 617, n. 36, t. 67, f. 7 ‡ (1875); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 5 (1877).

This is a species enumerated by Mr. Butler in his list of the Butterflies of Malacca collected by Capt. Pinwill, and the specimen here figured has been compared (in company with Mr. Butler) with the type of *T. pumilaris*, from which it slightly varies. I give a copy of the original description:—

"Sulphur-yellow; primaries with the costal margin blackish, outer margin rather broadly and regularly brown-bordered, the border being bisinuated within the median interspaces; secondaries with brown spots at termination of the nervures, sometimes concurrent; body blackish: wings below paler yellow; nervures terminating in black dots; an annular marking at the terminations of the discoidal cells; secondaries with an annular marking on the subcostal area near the base; body pale dull yellow: expanse of wings 1 inch to 1 inch 3 lines."

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.).—New Hebrides; Tanna, Vaté (Brit. Mus.).

Mr. Butler adds to his description the following remarks:—"This species belongs to the *T. hecabe* group, but differs from all its allies in its narrow elongated primaries with more rounded apex: the sinuation of the outer border is also much less marked; so that the insect has a very different aspect."

The specimen here figured, and which has been compared with the type, does not bear out these distinctions, and as Mr. Butler could find no "distinguishing characters" to separate the Malayan form collected by Capt. Pinwill from the representative in the New Hebrides, § we can see that it varies in itself. Heretical as it may appear, the writer believes that any Malayan lepidopterist can prove that this also is but a form of *T. hecabe*.

\* The minute dark outer marginal spots exist as in *T. hecabe*, but have unfortunately been overlooked by our artist.

† Trans. Ent. Soc. 1882, p. 488-9.

‡ This figure is very indifferent and confusing.

§ Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550.



6. *Terias senna*. (Tab. XXVI., fig. 13 ♂; Tab. XXV., fig. 14 ♀.)

*Terias Senna*, Felder, Reise Nov. Lep. ii. p. 212, n. 226 (1865).

*Terias santana*, var. *senna*, Bntl. Proc. Zool. Soc. 1871, p. 535.

Male and Female. Wings above pale sulphureous; anterior wings with the basal portion of costal margin speckled with blackish, thence narrowly black to the apical and outer marginal black area, which is very broad, commencing at less than midway between end of cell and apex of wing, oblique to near discoidal nervule, then curved inwardly to near upper median nervule, strongly excavated and sinuated between upper and lower median nervules, and terminating broadly on inner margin near outer angle. Wings beneath in some specimens almost spotless (as in the female here figured), in others (as in the male specimen figured), with distinct double dark disco-cellular streaks on both wings, an elongate spot between upper discoidal nervule and costal margin of posterior wings, and with some indistinct dispersed discal mottled markings, especially on posterior wings; in some specimens the outer black area to the anterior wings is reflected beneath.

Var. *a. Terias inanata*,\* Bntl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 4 (1877).

This variety appears to have the black margin of the anterior wings somewhat narrower than in typical specimens.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Com. de Castelnau—coll. Feld.; Pinwill—Brit. Mus.; Biggs—coll. Dist.).

This species seems clearly the *T. senna* described by Felder, and I possess four examples, all perfectly constant in markings above, but varying beneath as previously described. It is closely allied to the *T. venata*, Moore.

7. *Terias harina*. (Tab. XXV., fig. 13 ♂.)

*Terias Harina*, Horsfield, Cat. Lep. E. I. C. p. 137, n. 63 (1829); Boisd. Sp. Gén. i. p. 668, n. 25 (1836); Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 320, n. 1 (1867); Bntl. Proc. Zool. Soc. 1871, p. 540, p. 94; Druce, Proc. Zool. Soc. 1873, p. 354, n. 1; Wood-Mas. & de Nic. J. A. S. Beng. vol. xlix. p. 235, n. 57 (1880).

*Eurema formosa*, Hübn. Zutr. Ex. Schmett. f. 979, 980 (1837).

*Terius formosa*, Moore, Proc. Zool. Soc. 1877, p. 590; ib. 1878, p. 836; Bntl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 550, n. 1 (1877); de Nic. J. A. S. Beng. vol. li. p. 63, n. 186 (1882).

Male. Wings above pale sulphureous; anterior wings with the apex and outer margin—narrowing towards outer angle—blackish; posterior wings *without* dark marginal border. Wings beneath pale sulphureous and unspotted.

Female. Wallace describes this sex as “much paler, and sometimes has a broader apical border.”†

Exp. wings, ♂, 40 to 48 millim.

HAB.—Continental India; Sikkim (de Nic.); Assam, Silhet (Brit. Mus.).—Andaman Islands; Port Blair (Moore, Wood-Mas. & de Nic.).—Tenasserim; Hatsiega (Limborg—Moore).—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Künstler—Calc. Mus.); Malacca (Pinwill—Brit. Mus.); Singapore (Kerr—coll. Dist.).—Java (Horsfield).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).—Philippine Islands (Wallace).—Celebes (coll. Dist.).—Amboina, Waigiou (Brit. Mus.).—Batchian, Ceram, Aru Islands (Wallace).

\* This species was originally described from specimens collected at the New Hebrides, and I here only refer to the Malaccan specimen, enumerated under the same name by Mr. Butler.

† Trans. Ent. Soc. ser. 3, vol. iv. p. 320 (1867).

Genus *DERCAS*.

*Dercas*, Boisduval, in Doubl. Gen. Diurn. Lep. p. 70 (1847); Butl. Cist. Ent. vol. i. p. 45 (1870).

Anterior wings subtriangular, the costal margin convex, the apex more or less dentate, the outer margin oblique, the inner margin concavely sinuate. Costal nervure terminating on costa a little beyond end of cell; first subcostal nervule emitted at less than one-third before end of cell, second near end of cell, third and fourth subcostal nervules bifurcating nearer end of cell than apex of wing, fifth emitted at about two-thirds the distance between end of cell and bifurcation of third and fourth; upper disco-cellular nervule concave and a little less than one-half the length of lower, which is directed outwardly towards its base; upper median nervule convexly rounded at base and emitted from end of cell; second from a little before end of cell, lower at about one-third before end of cell; cell short and broad; submedian nervure somewhat bent inwardly near base, and then outwardly along its apical half. Posterior wings elongately and irregularly subovate; costal margin obliquely convex, outer margin prominently and angularly produced at upper median nervule, from whence to anal angle the margin is more or less concavely sinuate. Costal nervure short, extending to about half the length of costal margin; first subcostal nervule emitted at about one-fourth before end of cell, second from end of cell; upper median nervule short and oblique, lower more than twice the length of upper and bent inwardly; upper median nervule from end of cell, second emitted at about half the distance from first as from third; submedian nervure moderately bent outwardly; internal nervure bent inwardly. Body moderately robust, pronotum pilose; antennæ short, with a gradually formed but distinct apical club; palpi short, compressed, broad, and clothed with long adpressed hairs, apical joint minute.

This genus is of small extent, and may be taken as an Eastern representative of the genus *Gonepteryx*. *Dercas* is found in Continental India, the Indo-Malayan region, and in China. One species inhabits the Malay Peninsula.

1. *Dercas gobrias*. (Tab. XXVI., fig. 18 ♂.)

*Gonepteryx Gobrias*, Hewitson, Trans. Ent. Soc. ser. 3, vol. ii. p. 246, n. 5, t. 16, f. 1 (1864); Butl. Proc. Zool. Soc. 1865, p. 432, t. 25, f. 4.

*Rhodocera Gobias*, Voll. Mon. Pier. p. 63, n. 1 (1865).

*Dereus Gobrias*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 398, n. 1 (1867); Druce, Proc. Zool. Soc. 1873, p. 356.

Male. Wings above bright sulphureous, the costal margin—especially near base—more or less infuscated, the apex broadly dark chocolate-brown,—this patch is inwardly sinuate to discoidal nervule, and then concavely narrowed outwardly; outer margin narrowly dark chocolate-brown, all the brown markings narrowly inwardly margined with ochraceous; an ochraceous disco-cellular streak at end of cell, and an oblique narrow ochraceous discal fascia. Posterior wings with the outer margin narrowly chocolate-brown, the fringe reddish ochraceous. Wings beneath as above, but anterior wings with the costal margin—especially near base—reddish ochraceous, followed by two small costal spots of the same colour, the apical patch and outer margin paler than above, and the first with an oblique violaceous spot, the disco-cellular spot and the discal fascia darker than above; posterior wings with some reddish ochraceous markings at base, and with an oblique, narrow, discal, ochraceous fascia. Pronotum dark greyish; eyes castaneous; abdomen sulphureous; body beneath, with legs, concolorous with wings.

Exp. wings, ♂, 65 to 68 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Künst.—Calc. Mus.).—Sumatra (Hewits.).—Java (coll. Dist.).—Borneo (coll. Godm. & Salv.).

I have not as yet seen the female of this species, which is described by Mr. Wallace as being "larger than the male, pale yellow, the discoidal spot and transverse streak almost obsolete."\* The same author describes *D. gobrias* as flying "slowly in forest clearings near the ground, often settling in damp places." †

### Genus IXIAS.

*Ixias*, Hübner, Verz. bek. Schmett. p. 95 (1816); Butl. Cist. Ent. vol. i. p. 48 (1870); Moore, Lep. Ceyl. vol. i. p. 125 (1881).

*Thestias*, Boisd. Sp. Gén. i. p. 590 (1836); Doubl. Gen. Diurn. Lep. p. 60 (1847).

Anterior wings subtriangular, costal margin arched and convex towards apex, outer margin somewhat oblique and rounded at outer angle, inner margin slightly sinuate. Costal nervure very robust, terminating on costa a little beyond end of cell; first subcostal nervule emitted at about one-third before end of cell; second about midway between base of first and apex of cell; third and fourth bifurcating somewhat nearer apex of wing than end of cell; fifth bifurcating a little beyond end of cell; upper disco-cellular nervule strongly concave, shorter than the lower, which is less prominently concave; upper median nervule from end of cell, first and second median nervules nearer together than second and third; submedian nervure strongly sinuate. Posterior wings subovate, posterior margin slightly waved. Costal nervure extending to about two-thirds of costal margin, first subcostal nervule emitted at about one-fourth before end of cell; disco-cellular nervules oblique, the lower one longest and bent at its junction with the upper; position of median nervules much the same as in anterior wings, submedian nervure somewhat straight. Body moderately robust: pronotum hairy; antennæ slender, of moderate length, and with a well-formed apical club; legs somewhat slender; palpi clothed beneath with long adpressed hairs, the apical joint minute.

This genus appears to be distributed throughout India and the Indo-Malayan region; it is also found in many other parts of the Malayan Archipelago, is recorded from China, and, according to Mr. Butler, is also found on the White Nile. ‡

#### 1. *Ixias birdi*. § (Tab. XXVI., fig. 4 ♂.)

*Ixias Birdi*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 351 (1883).

Male. Anterior wings black; basal third (consisting of lower and inner half of cell obliquely terminating at a little beyond base of lower median nervule, and from thence continued to inner margin at about one-fourth from posterior angle) sulphureous; the black area is invariably angulated beneath the lower median nervule, and is crossed by a broad irregular orange-coloured fascia, divided by the black nervules, commencing a little above the costal nervure, and outwardly oblique to upper discoidal nervule, then convexly suberect to upper median nervule, after which it is outwardly elongated, and terminates at about the lower median nervule; inwardly it is excavated at the disco-cellular nervules, before which and in the cell it possesses an extension of two irregular spots. Posterior wings sulphureous, with a broad outer black margin. Wings beneath sulphureous; anterior wings faintly showing the orange-coloured fascia above, sparingly speckled with fuscous in upper portion of cell and along the costal and outer

\* Trans. Ent. Soc. ser. 3, vol. iv. p. 398 (1867).

† Ibid. p. 397.

‡ Trans. Ent. Soc. 1871, p. 254. nos. 14 and 15.

§ Named after Mrs. Bishop, who, writing under her well-known maiden name (Isabella L. Bird), is the author of a recent and pleasant work on the Malay Peninsula, entitled 'The Golden Chersonese.'

margins (most broadly so at apex), and with a dark fuscous spot at outer angle; posterior wings also sparingly speckled with fuscous. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 54 to 56 millim.

HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.); Perak (Künstler—Calc. Mus.); Sungei Ujong (Godfery—coll. Dist.).

This species is allied to the *I. anexibia*, Hübn., a species found in Continental India, and to the *I. latifasciatus*, Butl., described from Burma. Several species of this group of the genus have a very similar facies, if examined superficially, but the extent of the black apical area to the anterior wings, with the size and shape of the orange-coloured fascia, will generally alone afford a key to differentiation.

#### Genus APPIAS.

*Appias*, Hübner, Verz. bek. Schmett. p. 91 (1816); Butl. Cist. Ent. vol. i. p. 49 (1870); Moore, Lep. Ceyl. vol. i. p. 134 (1881).

*Catophaga*, Hübn. Verz. bek. Schmett. p. 93 (1816); Moore, Lep. Ceyl. vol. i. p. 131 (1881).

*Hiposcritia*, Geyer, in Hübn. Zutr. iv. p. 16 (1832); Moore, Lep. Ceyl. vol. i. p. 133 (1881).

*Tachyris*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 361 (1867).

*Huphina*, Moore, Lep. Ceyl. vol. i. p. 136 (1881).

Anterior wings subtriangular, costal margin arched and convex, the apex either pointed and subacute or rounded, outer margin slightly concavely sinuate, inner margin slightly sinuate. Costal nervure extending to a little beyond end of cell; first subcostal nervure emitted beyond middle of cell, second rather nearer to first than to apex of cell, third and fourth bifurcating near apex of wing, fifth at about one-fourth beyond end of cell; upper disco-cellular nervule concavely bent, much shorter than the lower, which is more or less oblique; median nervules wide apart, first and second a little closer together than second and third; submedian nervure waved and bent inwardly at base. Posterior wings more or less elongately subovate, costal margin oblique, posterior margin rounded and very obscurely waved. Costal nervure almost reaching apex of wing; first subcostal nervure emitted at about one-third before end of cell; upper disco-cellular nervule oblique and slightly bent inwardly; lower oblique, slightly bent outwardly; upper median nervule from end of cell, first and second median nervules with their bases about half the distance apart as those of second and third; submedian nervure slightly curved outwardly. Body moderately robust; pronotum hairy, less moderately slender; palpi with the apical joint long and pointed, the second joint clothed with long hairs beneath. Legs moderately slender.

Mr. Wallace drew particular attention to the anal valves of the males as being "elongated and provided with a tuft of long and stiff hairs at each side of the base beneath,"\* and as peculiar and characteristic of his genus *Tachyris*—a character which, though applicable to that restricted genus, does not possess universal application in the more comprehensive genus *Appias* as here used.

This is a very extensive genus, the study of which has not been simplified by recent minute generic subdivision. It is found throughout the tropical portion of the Old World, and is not uncommon. Mr. Wallace describes most of the species he observed as flying swiftly, and "many of the males assemble in troops about wet places and on river margins, after the manner of the genus *Callidryas*." †

\* Trans. Ent. Soc. ser. 3, vol. iv. p. 362 (1867).

† Ibid.

1. *Appias nero*. (Tab. XXIV., figs. 9 ♂, 10 ♀.)

*Papilio Nero*, Fabricius, Ent. Syst. iii. 1, p. 153, n. 471 (1793); Don. Ins. Ind. t. 32, f. 1 (1800).

*Pieris Nero*, Boisd. Sp. Gén. i. p. 485, n. 72 (1836).

*Pieris Thyria*, Godt. Enc. Méth. ix. p. 147, n. 101 (1819); Luc. Lep. Ex. t. 25, f. 3 (1835).

*Pontia Thyria*, Horsf. Zool. Journ. v. p. 69, t. 4, f. 2 (1829).

*Pieris figulina*, Butl. Ann. Nat. Hist. ser. 3, vol. xx. p. 399, t. 8, f. 1 (1867).

*Tachyris nero*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 378, n. 40 (1867); Druce, Proc. Zool. Soc. 1873, p. 355, n. 5; Kheil, Rhop. der. Insel Nias, p. 34, n. 128 (1884).

*Appias nero*, Butl. Proc. Zool. Soc. 1872, p. 46, n. 26; Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 6 (1877).

*Appias figulina*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 7 (1877).

Male. Wings above either carmine or vermilion-red; anterior wings with the basal costal area speckled with fuscous and greenish, the neuration blackish, the apical area more or less infuscated, and with a more or less distinct submarginal series of obscure blackish spots placed on the nervules; posterior wings with the neuration only darkened towards outer margin, which is more or less distinctly fuscous. Wings beneath paler than above; anterior wings with the costal and apical areas more or less ochraceous, and with some obscure submarginal fuscous spots; posterior wings paler and more ochraceous than the anterior, the abdominal margin distinctly ochraceous,—in some specimens with a more or less obscure discal fuscous fascia. Body above fuscous, beneath greyish; thorax beneath, and legs more or less ochraceous.

Female. Darker than the male; anterior wings with the basal area infuscated, the costal area pale fuscous; the apex and outer margin broadly dark fuscous, and with an elongated transverse dark fuscous spot reaching from end of cell to near outer margin above the upper median nervule, and a submarginal dark fuscous spot extending between the second and third median nervules; posterior wings with the basal area infuscated, the outer margin broadly dark fuscous, and the neuration towards the outer margin also infuscated. Anterior wings beneath reddish ochraceous, with the dark markings as above, but paler and with a subapical transverse greyish streak. Posterior wings pale reddish-grey, with the outer margin fuscous, tinged with ochraceous, and an irregular broad fuscous submarginal fascia.

Exp. wings, ♂ and ♀, 70 to 73 millim.

HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.); Province Wellesley (colls. Sauer & Dist.); Perak (Künst.—Calc. Mus.); Malacca (Pinwill—Brit. Mus.); Singapore (Brit. Mus.).—Siam (Brit. Mus.).—Nias Island (Kheil).—Java (Brit. Mus.).—Borneo (coll. Godm. & Salv.—coll. Dist.).

This species is of a variable character, there being two forms of the male, one much brighter and paler than the other. This has induced Mr. Butler to separate these forms as distinct species, the pale form being identified as his *A. figulina*.\* I do not think, however, that this specific separation can be maintained, as precisely similar variation is found in allied species, and notably in the Celebesian *A. zarinda*, Boisd. A still more remarkable variation, and that of a structural character, is to be found in the bifurcation of the third and fourth subcostal nervules of the anterior wings, which in some specimens occurs much nearer to the apex of the wing than in others.

2. *Appias hippo*. (Tab. XXV., fig. 4 ♂, 5 ♀.)

*Papilio Hippo*, Cramer, Pap. Ex. iii. t. 195, B, C (1782).

*Pieris Hippo*, Godt. Enc. Méth. ix. p. 143, n. 89 (1819); Boisd. Sp. Gén. i. p. 534, n. 141 (1836).

*Appias hippo*, Butl. Proc. Zool. Soc. 1872, p. 47, n. 38; de Nic. J. A. S. Beng. vol. L. p. 52, n. 54 (1881).

*Pieris Eleonora*, Boisd. Sp. Gén. i. p. 481, n. 64 (1836).

*Appias eleonora*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 3 (1877).

\* Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551 (1877).

Male. Wings above creamy white; anterior wings with the costal area dark bluish-grey, the outer margin black, which is inwardly strongly sinuated and angulated between the nervules; posterior wings with the outer margin black as on anterior wings, but broadly preceded by bluish-grey. Anterior wings beneath creamy white, the costal (from near base), apical, and outer (inwardly angulated) areas dark fuscous, containing a subapical sulphureous spot; posterior wings dark sulphureous, the outer margin very broadly dark fuscous, which margin is inwardly sinuated and angulated. Body above and beneath greyish-white.

Female. Wings above dark fuscous; anterior wings with two whitish streaks beyond cell, and three large whitish streaks (the uppermost obscure) beneath cell, divided by the second and third median nervules; posterior wings with the basal half more or less greyish, the fuscous being darkest at margin, and from thence along the nervules. Anterior wings beneath as above, but with the greyish markings larger and brighter, an obscure paler subapical spot, and with a long greyish streak in cell; posterior wings sulphureous or greyish (as in specimen figured\*), the neuriation and the outer margin (broadly) dark fuscous.

Exp. wings, ♂ & ♀, 47 to 64 millim.

HAB.—Continental India; Bombay (Leith—coll. Dist.); Sikkim (de Nicéville).—Malay Peninsula; Province Wellesley (colls. Sauer & Dist.); Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Biggs—coll. Dist.).—Borneo; Sandakan (Pryer—coll. Dist.).

This species varies remarkably in size, as the above dimensions testify; it is, however, constant in markings, and is an abundant species.

### 3. *Appias enarete*, var.



FIG. 102.—*Appias enarete* ♂.

*Pieris Enarete*, Boisduval, Sp. Gén. i. p. 480, n. 61 (1836);  
Feisth. Rev. Zool. 1839, t. 18, f. 1.

*Appias enarete*, Butl. Proc. Zool. Soc. 1872, p. 47, n. 37.

*Tachyris enarete*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 366,  
n. 10 (1867); Druce, Proc. Zool. Soc. 1873, p. 355, n. 6.

Male. Wings above very similar to those of the preceding species (*A. hippo*), but with the bluish-grey submarginal border to the posterior wings broader. Wings beneath as in *A. hippo*, but the anterior wings with the subapical spot white, instead of yellow, and the posterior wings having the fuscous outer margin much broader, and the base of costal

margin, the costal and subcostal nervures, and the subcostal nervules more or less infuscated.

Exp. wings, ♂, 64 to 70 millim.

HAB.—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Malacca (coll. Moore).—Sumatra (Forbes—coll. Dist.).—Borneo (Lowe—coll. Dist.); Sandakan (Pryer—coll. Dist.).

The female is no doubt closely allied to the corresponding sex of *A. hippo*, but having the nervures and nervules of the posterior wings infuscated as in the male. This last character is not so prominent in the specimens from the Malay Peninsula as in those from Borneo, and the fuscous margin of the posterior wings is very slightly narrower.

\* This is probably a rubbed specimen. Fresh examples have the ground colour yellowish.

4. *Appias leis*. (Tab. XXV., fig. 7 ♂; figs. 6 & 10 vars. ♀.)

*Catophaga Leis*, Hübner, Zutr. Ex. Schmett. f. 771, 772 (1832).

*Tachyris alope*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 372, n. 24 (1867).

*Pieris Amasene*, Boisd. (nec Cram.), Sp. Gén. i. p. 535, n. 143 (1836); Voll. Mon. Pier. p. 35, n. 45 (1865).

*Pieris neombo*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. t. 2a, f. 3 (1857).

*Appias alope*, Butl. Proc. Zool. Soc. 1872, p. 43, n. 3.

Male. Wings above white, with a faint pale greenish tinge; anterior wings with the base and basal half of costal area bluish-grey (this is much more pronounced in some specimens than in others), remainder of costal margin narrowly black, apex and outer margin (the last inwardly dentately sinuate), and a submarginal curved fascia commencing at fifth subcostal nervule, forming a large subquadrate spot between the first and second median nervules, and from thence sometimes carried obscurely and narrowly towards outer angle, black; posterior wings with the base more or less bluish-grey, and with a marginal row of blackish spots placed between the nervules. Anterior wings beneath white, with a faint pale greenish tinge, basal area sulphureous, apical area pale ochraceous, and with the black submarginal fascia above more or less plainly visible beneath; posterior wings pale ochraceous. Body above with the pronotum dark bluish-grey, the abdomen pale fuscous; body beneath and legs more or less concolorous with wings.

Female. Wings above white, with a faint pale greenish tinge; anterior wings with the basal area dark greyish, the apex and outer margin broadly black, and containing four subapical white spots—the black area obliquely crosses the upper extremity of cell, is more or less truncate to second median nervule, and narrowed between second and third median nervules; posterior wings with the base dark greyish and the outer margin broadly blackish. Anterior wings beneath as above, but with the basal area ochraceous, and the apical black area from the four whitish spots to apex bluish-grey, with the extreme margin ochraceous; posterior wings with the extreme margins and neuration ochraceous, the black margin above being seen as bluish-grey beneath.

Var. *a*. ♀. The posterior wings beneath pale ochraceous, the outer margin more or less violaceous. (Tab. XXV., fig 6.)

Var. *b*. ♀. The posterior wings beneath dark ochraceous, with a broad chocolate-brown outer margin containing a few obscure ochraceous spots. (Tab. XXV., fig. 10.)

Var. *c*. ♀. Wings beneath with the apex of the anterior wings and the whole of the posterior wings dark ochraceous, the last with only faint indications of the dark chocolate-brown outer margin.

Exp. wings, ♂ & ♀, 46 to 62 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Biggs—coll. Dist.); Malacca, Ayer-panas (Godfery—coll. Dist.).—Sumatra (Brit. Mus.).—Java (Brit. Mus.).—Borneo (Brit. Mus.); Sandakan (Pryer—coll. Dist.).

Both sexes of this species are of a very variable character. Thus the males vary in the intensity of the black markings above, a peculiarity which is strongly exhibited in a series of North Bornean examples now before me, in the palest specimens of which the black marginal spots to the anterior wings are almost obliterated, and the black markings of the anterior wings are pale and somewhat effaced.

Some confusion has existed in the identification of this species, several authors having considered the *Catophaga leis*, Hübner, as being synonymic with the *Papilio paulina*, Cram., but besides colour differences in the female sex—such as the width of the dark margin to the posterior wings—the males are very distinct.

I feel no doubt as to the *Tachyris alope*, Wall., being the male sex of *A. leis*. I have received all male examples of the first and female representatives only of the second, whilst examination of the specimens in the British Museum and in the fine collection of Mr. F. Moore, show the same facts. Mr. Wallace\* refers to a Sumatran female of *A. alope* in the British Museum, but this is evidently an error, as Mr. Butler has searched for me and can find no such specimen, † the probability being that the female of some other species was substituted.

5. *Appias leptis*, var. *plana*. (Tab. XXV., fig. 9 ♀.)

*Pieris Leptis*, Felder, Reise Nov. Lep. ii. p. 163, n. 136 (1865).

*Appias plana*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 1 (1877).

*Hyposcritia plana*, Moore, MS.

Male. Wings above pearly-white; anterior wings with the base bluish-grey, the base of costal area dusted with dark greyish, the apical area broadly black, containing two small white subapical spots, and inwardly much angulated, touching upper extremity of cell, inwardly angulated between first and second median nervules, and narrowest and terminating a little above outer angle; posterior wings with a slight black marginal spot at apex. Anterior wings beneath with the black apical area as above, but with the apex broadly brownish-grey; posterior wings with an ochraceous tinge, the costal margin narrowly darker ochraceous. Body above with the pronotum clothed with long pale greenish hairs, the abdomen infuscated; body beneath and legs more or less concolorous with wings, legs streaked with fuscous.

Female. Wings above resembling the male, but with the black apical area of the anterior wings larger and with a black margin to the posterior wings, which is less distinct and more or less broken up from the discoidal nervule to anal angle. Wings beneath as in male, the posterior wings having sometimes a roseate tinge, and sometimes indications of an obscure, wavy and broken fuscous submarginal fascia.

Exp. wings, ♂, 50 millim.; ♀, 58 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Künstler—Calc. Mus.); Malacca (Pinwill—Brit. Mus.).—Sumatra (coll. Dist.).—Java (coll. Horsf.).—Borneo (Lowe—coll. Dist.).

Mr. Butler separated his species on the following characters of a *male* specimen, the colour ones of which, though slight, appear to be quite constant, but are considered here as only of a local varietal nature:—"Constantly differing from the Javan *A. leptis* of Felder in the absence of the black border of secondaries, a trace only of which exists at the apex of these wings; also larger, the primaries more produced; † the apex of primaries below and the secondaries of a clearer cream-colour." §

6. *Appias amalia*. (Tab. XXXIII., fig. 1 ♂.)

*Pieris Amalia*, Vollenhoven, Mon. Pier. p. 23, n. 28, t. 3, f. 6, ♀ (1865); Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 336, n. 22 (1867).

*Pontia Amalia*, Butl. Proc. Zool. Soc. 1872, p. 60, n. 24.

*Huphina amalia*, Moore, MS.

Male. Wings above creamy white. Anterior wings with the extreme base, basal costal area, and the median nervure dark bluish-grey; apical half of costal margin, apex and outer margin (from the last of

\* Trans. Ent. Soc. ser. 2, vol. iv. p. 373.

† Mr. Butler writes, "We have two male *A. alope* from Sumatra, and one of these is a little more heavily marked than the other, and may be the female of Wallace's description."

‡ This difference of size is not observable in the specimens before me.

§ Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551.



which some ray-like spots extend inwardly along the nervules, which give the appearance of two whitish spots surrounded by black near apex) black; the upper median nervule is also completely shaded with black. Posterior wings with the basal half from base, beneath cell to nearly the upper median nervule, deep orange-yellow, the outer margin black,—narrowed towards anal angle,—the extreme base, the subcostal and median nervules, and the subcostal nervules dark bluish-grey, the same colour preceding the black margin near apex. Anterior wings beneath creamy-white, the costal area, margins of cell, apex and outer margin fuscous, beyond cell are four whitish spots, and three subapical sulphureous spots, the base of costal area is also shaded with sulphureous. Posterior wings dark sulphureous, the anal area bright orange; outer margin fuscous, enclosing a large sulphureous spot between the subcostal nervules, and a smaller one beneath it, the margin also inwardly becomes somewhat broken and macular from the upper median nervule to anal angle; costal, subcostal and median nervules, subcostal and upper median nervules infuscated. Body and legs more or less concolorous with wings.

Female. This sex has not been seen by the writer, but has been described and figured by Vollenhoven as the male. The wings above are much infuscated, and the orange colour of the posterior wings extends quite to the upper median nervule, the outer margin of these wings being broadly fuscous to the orange anal area, and emits a short fuscous extension into that area.

Exp. wings, ♂, 50 to 54 millim.

HAB.—Malay Peninsula; Perak (Künstler—Calc. Mus.); Singapore (Wallace).—Sumatra (Vollenhoven).—Banca (Vollenhoven).

*A. amalia* is closely allied to *A. lea*, Doubleday (a species which will also probably be discovered in this fauna), but the narrower dark margin on the under surface of the posterior wings will alone distinguish it.

#### 7. *Appias andersoni*. (Tab. XXXIII., fig. 2 ♂.)

*Appias Andersoni*, Distant, Entomologist, vol. xviii. p. 146 (1885).

Male. Wings above creamy-white; anterior wings with the apical area—from less than midway between end of cell and apex of wing and narrowing to outer angle—blackish; neuration more or less blackish; basal half of costal area more or less shaded with greenish; posterior wings with the outer margin blackish, the neuration more or less darkened. Anterior wings beneath creamy-white, costal area and apex ochraceous, with a greenish tinge, the last with three obscure paler subapical spots; upper and lower cellular margins broadly blackish; beyond cell the colour is blackish, neuration more or less blackish, the two upper median nervules darkest and connected with a transverse black spot; outer margin pale blackish. Posterior wings beneath bright orange-yellow, the neuration blackish; apex of cell and two large elongate spots beyond cell pale sulphureous; apical and outer margins and a transverse fascia extending from discoidal nervule to about lower median nervule obscure olivaceous. Body above more or less concolorous with wings; abdomen beneath creamy-white; thorax and legs more or less concolorous with wings.

Exp. wings, ♂, 54 millim.

HAB.—Malay Peninsula; Perak (Künstler—Calc. Mus.).

This species belongs to the section of the genus which has been generically separated by Mr. Moore, under the name of *Huphina*; it is allied to the Javan *A. nama*, Moore, and is represented by a single example in a fine collection of Perak butterflies belonging to Dr. Anderson, of the Calcutta Museum, which collection has been most considerately placed in my hands for study and comparison.

8. *Appias cardena*. (Tab. XXXIII., fig. 3, ♂).

*Pieris cardena*, Hewitson, Ex. Butt. ii. *Pier.* t. 3, f. 17, 18 (1861).

*Pieris Hagar*, Voll. Mon. *Pier.* p. 38, n. 49, t. 4, f. 6 (1865).

*Tachyris cardena*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 363, n. 2 (1867); Druce, Proc. Zool. Soc. 1873, p. 355, n. 1.

*Appias cardena*, Butl. Proc. Zool. Soc. 1872, p. 43, n. 1; Trans. Linn. Soc. ser. 2. Zool. vol. i. p. 551, n. 2 (1877).

Male. Wings above creamy-white; anterior wings with the costal area bluish-grey, the apex and outer margin broadly blackish, and containing three white spots—two separated by the fifth median nervule and one between the first and second median nervules; posterior wings with the outer margin somewhat broadly blackish, the dark coloration extending inwardly and ray-like a short distance along the neuration. Anterior wings beneath as above, but the dark area much paler and more broken up with whitish; posterior wings with the neuration blackish, a broad blackish marginal fascia, most distinct at anal angle, and from thence to apex broken and indistinct, basal and abdominal area ochraceous, this hue not extending beyond the cell. Body above more or less concolorous with wings; abdomen beneath creamy-white; thorax and legs greyish-white, the last streaked with fuscous.

Exp. wings, ♂, 70 millim.

HAB.—Malay Peninsula; Perak (Künstler—Calc. Mus.); Malacca (coll. Wall.).—Sumatra (coll. Wall.); Padang (Vollenhoven).—Borneo (coll. Hewits.); Sarawak (Brit. Mus.).

In his paper on the 'Eastern Pieridæ,' Mr. Wallace observes, in relation to this species, "my specimens are intermediate between Hewitson's and Vollenhoven's figures, and I have no doubt but that they represent one rather variable species."\* This remark exactly applies to the Perak specimen here figured, for an examination of which I am indebted to Dr. Anderson.

## Genus SALETARA.

*Saletara*, Distant, *antea*, p. 287.

This genus is closely allied to *Appias*, and is separated on the structural characters of the subcostal nervules of the anterior wings, which, as in *S. nathalia*, Feld., number five in the male and four in the female, or, as in *S. panda*, Godt.,† number only four in each sex. This variation exists in the third and fourth subcostal nervules, which when present in the male bifurcate close to the apex of the anterior wing.

This is a genus in which we can almost see the characters in course of consolidation. Not only is there the difference already pointed out between the subcostal nervules in *S. nathalia* and *S. panda*, but in a specimen of the first-named species in my own collection, one wing possesses the third and fourth subcostal nervules and the other wing only one of them, as in the female, and as in both sexes of *S. panda*.

*Saletara* is a genus of small extent, and is apparently confined to the Malay Peninsula and some of the islands of the Malayan Archipelago.

\* Trans. Ent. Soc. ser. 3, vol. iv. p. 363 (1867).

† According to the series of that species contained in the British Museum.

1. *Saletara nathalia*. (Tab. XXVI., fig. 1 ♂, 2 ♀.)

*Pieris Nathalia*, Felder, Wien. Ent. Mon. vi. p. 285, n. 40 (1862).

*Tachyris Nathalia*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 369, n. 16 (1867); Druce, Proc. Zool. Soc. 1873. p. 355, n. 2; Kheil, Rhop. der Insel. Nias, p. 34, n. 125 (1884).

*Appias nathalia*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 4 (1877).

Male. Wings above very pale ochraceous; anterior wings with the costal and outer margins dark fuscous. Wings beneath as above, but with the posterior wings darker ochraceous and the fuscous margins to the anterior wings very much paler than above, the outer fuscous margin being often practically obsolete. Body above more or less dark greyish or fuscous, the anterior area of pronotum greenish ochraceous; body beneath with legs more or less concolorous with wings, the legs streaked with fuscous.

Female. Anterior wings above whitish, posterior wings pale sulphureous; anterior wings with the basal area dark greyish, the costal area (from about middle of cell), the apex and outer margin broadly dark fuscous; posterior wings with the outer margin somewhat broadly dark fuscous, the dark margin being inwardly broken and sinuated towards apex. Anterior wings beneath as above, but with the basal area ochraceous, the apical and outer marginal dark border somewhat paler than above and abbreviated, the whole apical area very pale violaceous, with the extreme margin ochraceous. Posterior wings paler sulphureous than above, the costal and outer margins narrowly ochraceous, and the outer dark margin above seen as pale obscure violaceous beneath.

Exp. wings, ♂ and ♀, 54 to 60 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Ayer-panas (Godfery—coll. Dist.); Singapore (coll. Wall.).—Nias Island (Kheil).—Sumatra, Java, Borneo (Wallace).—Celebes (coll. Dist.).—Philippine Islands (coll. Felder).

This does not appear to be a very common species, the female especially being seldom received from collectors.

2. *Saletara panda*.

*Pieris Panda*, Godart, Enc. Méth. ix. p. 147, n. 102 (1819); Boisd. Sp. Gén. i. p. 485, n. 71 (1836).

*Pieris Sulphurea*, Voll. Mon. Pier. p. 32, n. 41, t. 4, f. 4 (1865).

*Tachyris panda*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 368, n. 15 (1867).

*Appias panda*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 5 (1877).

A single specimen collected by Capt. Pinwill was recorded by Mr. Butler as *A. panda*, with the qualifying remark, "This appears to be only the worn male of *A. nathalia*; but the black border seems narrower." I have examined this specimen, and find the fourth subcostal nervule absent,—a character which, as before remarked, is peculiar to *A. panda*,—though the possession of a specimen of *A. nathalia*, in which that nervule is present in one wing and not on the other, points to a gradual transition of that character between the two species.

Male. *A. panda* principally differs from *A. nathalia* by the more sulphureous coloration of the wings.

Female. Differing principally from the corresponding sex of *A. nathalia* by having the ground colour of both wings sulphureous.

Exp. wings, 58 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Sumatra (Forbes—coll. Dist.).—Java (Brit. Mus.).

JUNE 20, 1885.

4 M

## Genus HEBOMOIA.

*Hebomoia*, Hübner, Verz. bek. Schmett. pp. 95, 96 (1816); Doubl. Gen. Diurn. Lep. p. 62 (1847); Butl. Cist. Ent. vol. i. p. 48, n. 28 (1870); Moore, Lep. Ceyl. vol. i. p. 127 (1881).  
*Iphias*, Boisd. Sp. Gén. i. p. 595 (1836); Wall. Journ. Ent. ii. p. 1 (1863).

Anterior wings subtriangular, the costal margin somewhat strongly convex, the apex subacute, outer margin oblique, inner margin concavely sinuate. Costal nervure extending to about two-thirds the length of costal margin; first and second subcostal nervules emitted close together at about one-fourth before the end of cell, third emitted close to end of cell, third and fourth bifurcating near apex; upper discoidal nervule emitted at upper end of cell, lower a little above middle end of cell; upper disco-cellular nervule oblique and slightly concave, lower disco-cellular concave, obliquely bent outwardly at its lower half; upper median nervule moderately convex and emitted at end of cell, second rather nearer first than third, which is emitted a little beyond middle of cell; submedian nervure strongly recurved; cell long and broad, extending a little beyond middle of wing. Posterior wings broadly obovate; costal margin arched at base and then nearly straight, being very slightly oblique; outer margin convex and moderately waved, abdominal margin oblique. Costal nervure convex and extending to near apex, precostal nervure prominent, and curved and directed outwardly; first subcostal nervule emitted a little beyond middle of cell, second at about end of cell; disco-cellular nervules long and oblique, lower about one-third longer than upper; cell long and extending to about two-thirds the length of wing; upper median nervule slightly convex and emitted from end of cell, second much nearer first than third, which is emitted beyond middle of cell; submedian nervure nearly straight, internal nervure slightly recurved. Body long and robust; pronotum clothed with long hairs; head pilose and tufted anteriorly; palpi clothed with long and stiff hairs beneath, the apical joint minute; legs long and slender; antennæ long and gradually thickened into an ill-defined and truncated apical club.

*Hebomoia* is a genus of moderate extent, is found in Continental India, Ceylon, the Andaman Islands, and the Malay Peninsula, and is distributed more or less throughout the Malayan Archipelago. Considerable variation ensues in the amount of sexual difference among the species. Thus in *H. glaucippe* (a species found in this fauna) the female more or less resembles the male, with additional dark markings, but in *H. borneensis* and *H. celebensis* (species whose habitats are denoted by their names) the females are altogether without the red subapical markings to the anterior wings.

1. *Hebomoia glaucippe*. (Tab. XXVI., fig. 9 ♂.)

- Papilio Glaucippe*, Linnaeus, Mus. Utr. p. 240 (1764); Syst. Nat. i. 2, p. 762, n. 89 (1767); Drury, Ill. Ex. Ent. i. t. 10, f. 3, 4 (1773); Clerck, Icones, t. 35, f. 1 (1764); Cram. Pap. Ex. ii. t. 164, A—C (1779); Fabr. Syst. Ent. p. 474, n. 134 (1775); Spec. Ins. ii. p. 45, n. 191 (1781); Mant. Ins. ii. p. 21, n. 216 (1787); Ent. Syst. iii. 1, p. 198, n. 618 (1793); Donovan, Ins. China, t. 31, f. 1 (1798).  
*Papilio Callirhoe*, Fabr. Syst. Ent. p. 473, n. 133 (1775).  
*Pieris Glaucippe*, Godt. Enc. Méth. ix. p. 119, n. 2, t. 13, f. 1 (1819).  
*Colias Glaucippe*, Horsf. Cat. Lep. E. I. C. p. 130, n. 55 (1829).  
*Iphias Glaucippe*, Boisd. Spec. Gén. Lep. i. p. 596, n. 1 (1836); Blanch. Hist. Nat. Ins. p. 432 (1841); Wall. Journ. Ent. ii. p. 2 (1863); Voll. Mon. Pier. p. 53, n. 1 (1865).  
*Anthocaris Glaucippe*, Lucas, Lep. Exot. p. 66, t. 31, f. 3 (1845).

*Hebomoia Glaucippe*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 60, n. 105 (1857); Moore, Proc. Zool. Soc. 1878, p. 837; Lep. Ceyl. vol. i. p. 127, t. 49, f. 1, 1a, b (1881); Snell. Tijds. Ent. xix. p. 17, n. 62 (1876); Lep. v. Midd. Sum. p. 23, n. 1 (1880); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 551, n. 1 (1877); De Nic. J. A. S. Beng. vol. L, p. 52, n. 57 (1881); Ibid. vol. li. p. 64 (1882); Aurivill. Kongl. sv. vet. Acad. Handl. Band 19, no. 5, pp. 53-4 (1882).

Male. Wings above creamy-white, with a very faint pale greenish tinge; anterior wings with the basal half of costal area speckled with dark fuscous; apex (crossing upper end of cell and more or less oblique to near outer angle) blackish, containing six large and elongate contiguous reddish-orange spots, only divided by the nervules, the second, third, fourth and fifth containing a blackish spot near their apices, the sixth shortest and inwardly blending with the blackish ground colour, the first narrowest, and the first and second preceded at their base by a small reddish spot of the same hue situate in upper extremity of cell; posterior wings with a few marginal blackish spots (placed on the apices of the nervules) on the apical half of wing. Anterior wings beneath creamy-white, the black apical area above mottled pale brownish beneath; posterior wings mottled pale brownish, with darker reticulations and with an oblique fuscous line passing through centre of cell and terminating on outer margin between the discoidal and upper median nervules. Body above and abdomen beneath pale greenish, anterior collar of pronotum and head pale brownish; thorax beneath and legs more or less concolorous with wings; legs streaked with brownish.

Female. Resembling the male, but the anterior wings above with the creamy-white having a more decided pale greenish tinge, the blackish spots at the apices of the reddish-orange spots larger; posterior wings with a marginal and submarginal series of large dark fuscous spots, the marginal series being more or less confluent. Wings beneath as in male.

Exp. wings, ♂ and ♀, 90 to 100 millim.

HAB.—Continental India; Sikkim (de Nicéville); Darjeeling, Madras (coll. Dist.).—Ceylon (Thwaites—coll. Dist.).—Tenasserim; Houngduran Source (Limborg—Moore).—Malay Peninsula; Perak (Kunst.—Calc. Mus.; coll. Godfery); Malacca (Pinwill—Brit. Mus.); Sumatra (Snellen).—Java (Horsfield); Batavia (Snellen).

Mr. de Nicéville writes of this species that "it has a very rapid flight; when settling on a flower it is very inconspicuous, the mottled hind wing and the apex of the fore wing, which is also much mottled and which alone is left uncovered by the hind wing, render it difficult to be seen on account of its close resemblance to a dead leaf."\*

In Java, according to Dr. Horsfield, the larva feeds "on a species of *Capparis*, distinguished by the native name *Wanwannan*."† In Ceylon the same food-plant is recorded by Dr. Thwaites.‡

The larva and pupa have been already figured in this work (*antea*, p. 283, figs. 91, 92).

### Genus NEPHERONIA.

*Nepheronia*, Butler, Cist. Ent. vol. i. pp. 38, 53 (1870); Moore, Lep. Ceyl. vol. i. p. 138 (1881).

*Valeria*, Horsf. Cat. Lep. E. I. C. p. 139 (1829).

*Eronia* (part), Doubl. Gen. Diurn. Lep. p. 64 (1847). §

Anterior wings subtriangular, costal margin arched and convex, outer margin generally more or less concave (sometimes scarcely discernible), inner margin slightly sinuate. Costal nervure extending to

\* J. A. S. Beng. vol. L, p. 52 (1881).

† Cat. Lep. E. I. C. p. 131.

‡ Moore's Lep. Ceyl. vol. i. p. 128.

§ Mr. Moore (Lep. Ceyl. vol. i. p. 138) gives *Eronia* (part), Boisduval, as a synonym of this genus. This, however, is a slip, as Boisduval's type, and only species given, is the *E. clodora*, Hübn., which is given by Mr. Butler as the type of that genus and not included in his *Nepheronia*.

almost two-thirds the length of costal margin; first and second subcostal nervules emitted close together at about one-fourth before end of cell, fourth and fifth bifurcating near apex, third emitted a little before their bifurcation; upper disco-cellular nervule deeply concave, lower oblique, nearly straight; upper discoidal nervule emitted from upper end of cell, lower from about middle end; upper median nervule nearly straight and emitted from end of cell, the median nervules about equally wide apart; submedian nervule waved. Posterior wings subconical; costal margin nearly straight, slightly convex, outer margin more or less convex. Costal nervule extending to apex of wing; first subcostal nervule emitted at about one-fourth before end of cell; disco-cellular nervules oblique; upper median nervule short, emitted from end of cell; lower median nervule from about middle of cell; submedian nervule nearly straight; internal nervule recurved. Body long; pronotum hairy; palpi short, hairy beneath; legs long and slender; antennæ moderately long, with a distinctly formed apical club.

*Nepheronia* is found throughout the tropical portions of Africa and Asia. The species inhabiting the two continents have a very dissimilar facies, those from Africa being much more brightly coloured. Two species are here enumerated as found in this fauna.

The females are excellent "mimics" of species of the protected genus *Danais*.

### 1. *Nepheronia lutescens*. (Tab. XXVI., fig. 14 ♂.)

*Nepheronia lutescens*, Butler, Cist. Ent. vol. ii. p. 431 (1879).

*Eronia lutescens*, Moore, Proc. Zool. Soc. 1878, p. 838.\*

Male. Wings above pale greenish, the neuration (excepting the greater portion of the disco-cellular nervules of both wings) dark fuscous; anterior wings with the costal area blackish, speckled with greyish, the apex and outer margin somewhat broadly blackish, the last continued in short ray-like streaks along the nervules; posterior wings with the outer margin broadly blackish, and inwardly continued as on anterior wings, the subcostal nervule and lower subcostal nervule being somewhat broadly infuscated. Wings beneath as above, but paler, and with the apical and marginal dark markings almost obsolete.† Body above fuscous, beneath greyish; femora dark, covered with greyish pile; tibiæ and tarsi pale brownish.

Exp. wings, ♂, 78 millim.

HAB.—Tenasserim; Meetan (Limborg—Moore).—Malay Peninsula; Perak (Künstler—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.).—Borneo (Low—Brit. Mus.); Sandakan (Pryer—coll. Dist.); Banjermasin (coll. Dist.).

The writer is only acquainted with the male of this species, which appears to be moderately rare in the Malay Peninsula.

### 2. *Nepheronia hippia*, var. *gæa*. (Tab. XXVI., figs. 16 ♂, 12 ♀.)

*Papilio Hippia*, Fabricius, Mant. Ins. ii. p. 55, n. 545 (1787).

*Eronia Gæa*, Felder, Reise Nov. Lep. ii. p. 190, n. 188 (1865).

*Pieris Valeria*, var. *A.*, Boisd. Sp. Gén. i. p. 444, n. 9 (1836).

Male. Wings above very pale greenish. Anterior wings with the neuration, costal area, apex, and outer margin (the last inwardly and ray-like, continued for a short distance along the nervules) blackish,

\* Though Mr. Moore's citation of the species has priority over Mr. Butler's description, the difference of dates is a matter of accident only, and as Mr. Moore did not describe it, no difficulty arises.

† In some Bornean specimens the under surfaces of the lower wings have a decidedly ochraceous tinge.

the apical and outer black area with a series of small pale spots. Posterior wings with the neuration and the outer margin blackish (the last often containing a small pale spot near anal angle as in the specimen figured), the subcostal nervure and subcostal nervules being very broadly black. Wings beneath much paler than above, the posterior wings especially having a pearly reflection, the dark margins to both wings much paler than above, but *both* containing a series of paler spots. Body above and beneath more or less concolorous with wings; legs greyish, the tibiæ and tarsi pale brownish.

Female. Wings above fuscous, with the following greyish-white markings:—anterior wings with two long cellular streaks, a discal curved series of six elongate spots beyond cell, placed between the nervules, the fifth being short and broad, and the sixth longest, two long and inwardly connected fasciate-like spots between the third median nervule and the submedian nervure, and a submarginal series of smaller spots placed between the nervules, the innermost of the series being that placed between the first and second median nervules, and that at outer angle being duplex. Posterior wings marked much as the anterior wings, but the discal series of spots smaller and more uniform, the submarginal series more regular and the base of the cell and the abdominal area more or less ochraceous. Anterior wings beneath paler than above, but marked in like manner; posterior wings paler greyish, the disk more or less infuscated, the outer margin fuscous, with the submarginal row of pale spots as above. Body above and beneath more or less concolorous with wings.

Exp. wings, ♂, 75 to 80 millim.; ♀, 80 to 83 millim.

HAB.—Continental India; Canara (Brit. Mus.); Bengal (Stoliczka—coll. Feld.).—Burma (Brit. Mus. and coll. Dist.).—Tenasserim (Brit. Mus.).—Malay Peninsula; Quedah\* (coll. Dist.); Province Wellesley (coll. Dist.).

I treat this species as a variety of *N. hippia*, and as distinct from the *N. valeria*, Cram., by the character of the pale-spotted outer margin of the anterior wings. Even treated as a distinct variety, considerable variation is discovered amongst the female examples, particularly as regards the amount of ochraceous markings on the abdominal area of the upper surface of the posterior wings, and the depth of hue of the under surfaces of the same wings, which are either infuscated as in the specimen figured, or almost greyish as in other examples. The fuscous margin containing the series of pale spots is, however, always present.

#### Subfam. PAPILIONINÆ.

*Papilioninae*, Swainson, Cab. Cycl. p. 87 (1840); Bates, Journ. Ent. vol. ii. p. 177 (1864); Moore, Lep. Ceyl. vol. i. p. 141 (1881); Marsh. & de Nic. Butt. Ind. Burm. & Ceyl. vol. i. p. 18 (1882).

*Papilionidae*, Doubl. Gen. Diurn. Lep. i. p. 1 (1846); Trim. Rhop. Afr. Austr. p. 10 (1862).

*Papilionides*, Boisd. Sp. Gén. i. p. 171 (1836); Westw. Introd. Mod. Class. Ins. vol. ii. p. 349 (1840).



Abdominal margin of the hind wing curved inwardly, not chanelled to receive the abdomen.† Anterior tibiæ provided with

FIG. 103.—Larva and pupa of *Papilio pammon*. (From Horst. & Moore, Cat. Lep. Ins. Mus. E. I. C.)

\* I have adhered to the old way of spelling this name, though Keddah, or Kēdah, is now the general spelling.

† By an unfortunate oversight, at p. 283, in the diagnosis of the subfamily *Pierinae*, the word “nor” has been substituted for “but”, thus completely destroying the true character: “nor chanelled” should read “but chanelled.” The *Pierinae* being thus partly distinguished from the *Papilioninae* by having the abdominal margins of the posterior wings chanelled to receive the abdomen.

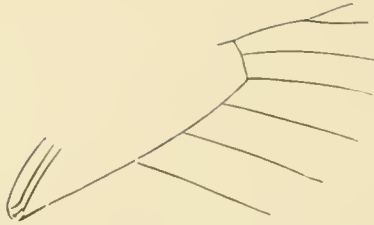


FIG. 104. — Anterior wing of *Papilio memnon*, showing position of median nervules.

a stout medial spur. Larvæ stout, subcylindrical; the prothoracic segment furnished with two retractile tentacles.\*

Anterior wings having the lower discoidal nervule united to the median nervure, and thus appearing as a fourth median nervule.

The *Papilionine*, by the above detailed characters, are the most distinct and easily recognised subfamily of Rhopalocera. The apparently four-branched median nervure of the anterior wings is found in no other group of butterflies, and is a neural feature of so simple and clear a character that a glance at the wings is sufficient to decide whether a butterfly belongs to the *Papilionine* or not. The larvæ, again, possess an extraordinary organ in a Y-shaped tentacle situate on the prothoracic segment, which, concealed in a state of repose, is capable of being suddenly thrown out by the caterpillar when alarmed. On this point Mr. Wallace has well remarked:—"When we consider this singular apparatus, which in some species is nearly half an inch long, the arrangement of muscles for its protrusion and retraction, its perfect concealment during repose, its blood-red colour, and the suddenness with which it can be thrown out, we must, I think, be led to the conclusion that it serves as a protection to the larva, by startling and frightening away some enemy when about to seize it, and is thus one of the causes which has led to the wide extension and maintained the permanence of this now dominant group." †

This subfamily includes but few genera, its strength lying in the genus *Papilio* itself. Three genera—or, as treated here, two genera and one subgenus—are found in the Malay Peninsula, and, excluding *Teinopalpus*, ‡ there is little probability of more being found, as the others are principally denizens of higher altitudes. These three genera, however, viz., *Ornithoptera*, *Papilio*, and *Leptocircus*, are of very unequal value, the first two being almost inseparable, in a structural sense, if we retain the genus *Papilio* in its old and undivided condition. There can be no question that in *Papilio*, as thus understood, we do find structural and neural characters that in other subfamilies are ranked as correctly proving the existence of distinct genera, and which, if the useful though artificial canons of classification were here rigidly adhered to, would compel the generic disintegration of *Papilio*.§ The objections, however, to that course appear to have at least considerable

\* Prof. Westwood (Introd. Mod. Class. Ins. vol. ii. p. 348) states that the larvæ are "never villose nor hairy," but this does not appear to be always true in the earlier stages of development, as Mr. Forsayeth describes the young larvæ of *Papilio erithonius* as differing greatly "from the mature caterpillar, having numerous processes, armed with stiff hairs or spines, along either side and head" (Trans. Ent. Soc. 1884, p. 386).

† Trans. Linn. Soc. vol. xxv. p. 3 (1865).

The use of this organ has been observed in the common Palearctic butterfly, *Papilio machaon*. Bonnet states that when he pressed this caterpillar, near its anterior part, it darted forth its horn as if it meant to prick him with it, directing it towards his fingers; but withdrawing it as soon as he left off pressing it. "This horn smells strongly of fennel, and probably is employed by the insect, by means of its powerful scent, to drive away the flies and ichneumons that annoy it" (Kirby & Spence, Introd. Ent. 7th ed. p. 418). Rennie observed the same action in larvæ of the butterfly found feeding on fennel in the Jardin des Plantes at Paris, and concludes that it might be "intended to intimidate the ichneumons from depositing their parasite eggs in its body, or warning off the thrushes or the carnivorous locust (*Acrida verrucivora*) from devouring it. On the same plant indeed where these caterpillars were feeding we saw one of the latter lurking about, no doubt with evil intent" ('Insect Miscellanies,' pp. 53-4). Mr. Forsayeth describes the larvæ of *Papilio erithonius* as found at Mhow, in Central India, and speaking of these tentacula, states that "on pressure between finger and thumb, a double horn, soft and erectile, of a pink colour, shoots out and quivers slightly. . . . When extrusion takes place a rather pungent, aromatic, but certainly not disagreeable, odour is given out. The larvæ seldom shoot forth these processes on being handled or irritated, but only on pressure being made" (Trans. Ent. Soc. 1884, p. 386). The odour thus emitted is not, however, always pleasant, as Lacordaire has informed us:—"Dans certaines espèces Américaines (*Papilio Crassus*, *Archelaus*, &c.), que nous avons eu occasion d'observer, cette odeur est plus ou moins désagréable" (Introd. à l'entomol. i. p. 108).

‡ A genus found in North-Eastern India.

§ The Ceylon species have thus been treated by Mr. Moore (Lep. Ceylon, vol. i.).



biological value. *Papilio* has its species existing in what may almost be called small "coteries," and thus has always been divided with facility into groups, which possess the advantages of genera, minus the true structural definitions. Divided in such groups the genus has been studied by some authors (as subsequently detailed) who have done so much to enrich our lepidopteral literature by a number of epoch-marking memoirs, and as the name *Papilio* is so universally known and used in connection with these butterflies, the writer will certainly pause before supporting a system which, though correct in classificatory practice, is likely to add new terrors to those numerous observers and lovers of nature who give us so many facts, and receive from cabinet entomologists so many divisional husks in return.

Taking the three genera *Ornithoptera*, *Papilio*, and *Leptocircus* as representing this subfamily (for these alone are found in this fauna) we can obtain an approximate idea as to the number of species known in entomological literature. In 1852 Mr. G. R. Gray published his Catalogue of the *Papilionidæ*, and enumerated 337 species; in 1864 C. and R. Felder, in their 'Species Lepidopterorum—Papilionidæ,' were able to give the names of 493 species, whilst subsequently Mr. Kirby, in his Catalogue, issued in 1871 and his supplemental list to 1877, only recognises 398 species.\* The Malayan region is exceedingly rich in *Papilioninæ*, and this, as Mr. Wallace has pointed out, can be readily appreciated by "comparing the number of species found in the different tropical regions of the earth."† The genus *Papilio* is almost ubiquitous, but *Ornithoptera* and *Leptocircus* are confined to the Eastern tropics.

During the last few years great attention has been paid to the anal structure of insects, as a guide to specific and generic division.‡ In this country two memoirs describing these organs in the Rhopalocera have been recently published. The one by Dr. Buchanan White, "On the Male Genital Armature in the European Rhopalocera,"§ and the other by Mr. P. H. Gosse, "On the Claspings Organs ancillary to Generation in certain Groups of the Lepidoptera,"|| which is confined to the *Papilioninæ* alone. Dr. White's studies led him to the conclusion that in the structure of these parts "not only generic, but in many (if not in every) species good specific characters are to be found." Mr. Gosse, however, does not speak in this unqualified sense, for though he observes that out of the number of specimens he had examined he had not found "any two species whose apparatus is alike, or even so nearly alike that a moment's observation is not sufficient to show the difference," yet he adds:—"It might seem that, by the aid of organs so uniformly present, so easily examined, and so varied

\* The discrepancy between the figures of the Felders and Kirby is due to the different estimate of the value of species held by the authors, many which are specifically recognised and described by the first being simply treated as varieties by the second. Even then too much statistical reliance must not be placed on Mr. Kirby's estimate, as in his original volume of 1871 he has *critically* enumerated the species, whilst in his Supplement he has merely *recorded* the recently described species. This author has since estimated the species of the genus *Papilio* alone as about 500 (Cassell's Nat. Hist. vol. vi. p. 50).

Of other collections we have the following published information:—The Natural History Museum at Leyden, in 1860, contained, according to Snellen van Vollenhoven, 158 species (Tijd. Ent. iii. pp. 70—88). In 1879 three other Catalogues were published. The first refers to the species contained in the collection of Mon. Ch. Oberthür at Rennes, and 343 species are recorded ('Études d'Entomologie,' Quatr. Livr.). The second is Mr. Kirby's 'Cat. Coll. Diurn. Lep. formed by the late W. C. Hewitson,' in which 339 species are catalogued. The third refers to the collection in the Museum of Science and Art, Dublin, is likewise made by Mr. Kirby, and enumerates 220 species (Scient. Proc. Roy. Dubl. Soc. 1879). Of purely local collections that contained in the late Museum of the East India Company may be mentioned, which numbered 62 species collected in the Indo-Malayan region alone (Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. 1857).

† Trans. Linn. Soc. vol. xxv. p. 27 (1865).

‡ This has been recently and exhaustively studied and described in the Trichoptera of the European fauna by Mr. R. M'Lachlan, and in the Rhyngotal subfamily *Cydninæ* by Dr. V. Signoret.

§ Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 357 (1877).

|| Ibid. vol. ii. p. 265 (1883).

in different species, while constant in the same, great facilities must be afforded for the determination of specific identity and limitation. Yet, in practice, I fear this cannot be carried out, without severing species which otherwise seem most closely allied, and linking others which have little else in common."\*

Discarding the further generic segregation of *Papilio* for the reasons already given, and unable to separate *Ornithoptera* from that genus save in a subgeneric sense, the writer can only enumerate two genera as Malayan representatives of this subfamily.



FIG. 105.—Anterior wing of *Leptocircus meges*, showing position of subcostal nervules.

#### SYNOPSIS OF GENERA.

- A. Third subcostal nervule of anterior wings free. - - - PAPILIO.  
 B. Third, fourth, and fifth subcostal nervules of anterior wings  
 with a common origin. - - - - - LEPTOCIRCUS.

#### Genus PAPILIO.

*Papilio*, Linnæus, Syst. Nat. i. 2, p. 744 (1767); Latr. Hist. Nat. Crust. Ins. xiv. p. 108 (1805); Enc. Méth. ix. p. 9 (1819); Boisd. Sp. Gén. i. p. 183 (1836); Doubl. Gen. Diurn. Lep. p. 5 (1846); Trim. Rhop. Afr. Austr. p. 11 (1862).

*Pathysa*, Reak. Proc. Entom. Soc. Philad. iii. pp. 503-4 (1864); Moore, Lep. Ceyl. vol. i. p. 141 (1881).

*Zetides*, Hübn. Verz. bek. Schmett. p. 85 (1816); Moore, Lep. Ceyl. vol. i. p. 144 (1881).

*Orpheides*, Hübn. Verz. bek. Schmett. p. 146 (1816); Moore, Lep. Ceyl. vol. i. p. 146 (1881).

*Hiades*, Hübn. Verz. bek. Schmett. p. 88 (1816); Moore, Lep. Ceyl. vol. i. p. 147 (1881).

*Luertias*, Hübn. Verz. bek. Schmett. p. 84 (1816); Moore, Lep. Ceyl. vol. i. p. 150 (1881).

*Menelaides*, Hübn. Verz. bek. Schmett. p. 84 (1816); Moore, Lep. Ceyl. vol. i. p. 151 (1881).

*Dalchina*, Moore, Lep. Ceyl. vol. i. p. 143 (1881).

*Harimala*, Moore, Lep. Ceyl. vol. i. p. 145 (1881).

*Charus*, Moore, Lep. Ceyl. vol. i. p. 149 (1881).

*Chilasa*, Moore, Lep. Ceyl. vol. i. p. 153 (1881).

This genus is difficult to accurately diagnose in its neural characters, and these will be more fully treated when discussing the different groups into which *Papilio* is divisible. As already pointed out, the apparently four-branched median nervure of the anterior wings is a strongly distinguishing character, and the free position of the third subcostal nervule of the same wings sufficiently separates it from *Leptocircus*, the only other genus of *Papilioninae* at present known from the Malay Peninsula. The body is moderately large, the pronotum rather stout and convex, the eyes prominent and rounded; the palpi short, closely pressed to the head, the apical joint being short and indistinct.

*Papilio* is widely distributed in most parts of the world, but the peculiarities of geographical distribution will be best given in application to its different groups as found in this fauna.

\* Messrs. Salvin and Godman have for the last few years exhaustively studied these organs in the Neotropical Rhopalocera, and made magnificent preparations of the same. The early publication of these details is greatly to be desiderated.

## Subgenus ORNITHOPTERA.

*Ornithoptera*, Boisduval, Voy. Astr. Lep. p. 33 (1832); Sp. Gén. i. p. 173 (1836); Doubl. Gen. Diurn. Lep. p. 3 (1846); Wall. Trans. Linn. Soc. vol. xxv. p. 35 (1865); Moore, Lep. Ceyl. vol. i. p. 154 (1881).

*Amphrisius*, Swains. Zool. Illustr. ser. 2, t. 98 (1832-3).

*Troides*, Hübn. Verz. bek. Schmett. p. 87 (1816).

*Pachlioptera* (part), Reak. Proc. Entom. Soc. Philad. iii. p. 504 (1864).

Anterior wings large, elongate and subtriangular, narrower in the male than in the female. Costal nervure extending to about three-fourths of costal margin; first subcostal nervule emitted at about middle of cell; second either at about one-fourth before end of cell, or at about one-third before cell as in *O. brookeana*, third emitted at about end of cell and terminating at apex of wing, fourth and fifth bifurcating at either less than one-half the distance between end of cell and outer margin, or at about one-fourth the distance, as in *O. brookeana*; cell extending beyond half the length of wing; upper disco-cellular nervule straight, shorter than the lower, which is somewhat obliquely concave; upper discoidal nervule emitted at junction of disco-cellular nervules, lower discoidal from extreme end of cell and having the appearance of a fourth median nervule; lower median nervule emitted either at about middle of cell or before middle as in *O. brookeana*, second median nervule nearer lower than upper, which is emitted before the end of cell at more than half the distance between it and the second median nervule; submedian nervure slightly curved and with a short basal internal nervule. Posterior wings small and subovate, costal margin convexly rounded, posterior margin convex and scalloped, abdominal margin folded. Precostal nervure with two branches, the lower most united with the costal nervure, which does not quite reach the apex of wing; first subcostal nervule emitted at about one-third before end of cell (at about one-half in *O. brookeana*); upper disco-cellular nervule oblique, longer than the second; discoidal nervule emitted near extreme end of cell; upper median nervule emitted a short distance before end of cell, second nearer upper than lower, submedian nervure recurved. Male with the abdomen provided with two large anal valves.

The larvæ, as described by Mr. Moore,\* are "elongated, thick, slightly attenuated at both ends, with dorsal and lateral rows of rather long fleshy tubercles."

I have here treated *Ornithoptera* as a subgenus—firstly, in order to use that well-known name, and secondly, because there is no valid character or characters to separate it generically from *Papilio*. Doubleday, seeing these difficulties, sought the divisional element in the larvæ, which he stated differed "in having an external forked sheath for the prothoracic tentacula."† This, however, has been disproved by Mr. Wallace, who found that in *O. poseidon* the larva has no "external sheath." Mr. Wallace therefore relied on a character found in the perfect insect, viz., the "anal valves in the male."‡ But Mr. P. H. Gosse has found a very similar structure in some species of *Papilio*,§ and Reakirt proposed a new genus—*Atrophaneura*—for a species of *Papilio*,|| which he found to be intermediate between *Papilio* and *Ornithoptera*, possessing the "large anal valves" of the last.¶ It thus seems that the only reliable characters to distinguish *Ornithoptera* are, to use the words of Mr. Wallace, "the great strength and size of these insects, the thick texture of their wings, their long, curved and stout antennæ, their

\* Lep. Ceyl. vol. i. p. 155. The larva and pupa of *O. darsius* are figured from drawings made by the Bros. de Alwis, ibid., t. 55, f. 1, b.—Horsfield has also figured the larva and pupa of a species found in Java (Cat. Lep. E. I. C. t. iv. f. 13, 13a).

† Gen. Diurn. Lep. p. 3.

‡ Trans. Linn. Soc. vol. xxv. p. 35 (1865).

§ Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 271 (1853).

|| *P. semperi*, Feld., from the Philippines (described by Reakirt as a new species).

¶ Proc. Entom. Soc. Philad. iii. pp. 446-7 (1864).

peculiar form, colour and distribution"; but these alone can only be considered as of subgeneric value.

*Ornithoptera* is not an extensive genus, and the difficulty of estimating the number of its species is enhanced by the divergent views held by different entomologists as to whether many of its members should be considered as species or varieties.\* Taking the analytical view, and looking at all the distinct forms as species, we find that these are between thirty and forty in number, and are truly Eastern, or rather almost Malayan, in distribution. *Ornithoptera* is found in Continental India, Ceylon, the Andaman Islands, Burma, the Malay Peninsula, throughout the length and breadth of the Malayan Archipelago,—as far east as the Duke of York Island and New Ireland,—and in Australia.

There are several distinct colour types in the genus, of which the yellow and black, dominant in this fauna, is confined to the Indo-Malayan region, whilst *O. brookeana* still forms a section by itself.†

A. Outer margin of anterior wings more or less concavely sinuate.

a. Extreme bases of wings beneath fringed with carmine.

1. **Ornithoptera rhadamanthus.** (Tab. XXVII. a, fig. 5 ♂, small var.)

*Ornithoptera Rhadamanthus*, Boisduval (part), Sp. Gén. i. p. 180, n. 8 (1836); Gosse, Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 289 (1882).

*Papilio (Ornithoptera) rhadamanthus*, de Nicév. J. A. S. Beng. vol. lii. p. 98, n. 255 (1883).

*Ornithoptera Rhadamanthus*, var. *Thomsonii*, Bates, Thompson's Straits of Malacca, p. 546 (1875).

Male. Anterior wings sooty black, the nervules more or less broadly margined with greyish, fringe alternately greyish and black; posterior wings bright and pale golden yellow, the neuration, costal margin (broadest at base), abdominal margin, and outer margin (inwardly scalloped, and with the last three scalloped spots divided by the median nervules inwardly margined with powdery fuscous) black. Wings beneath as above, but anterior wings with the greyish markings more distinct than above, and tinged with yellowish towards inner margin; posterior wings with the powdery fuscous near anal angle much less distinct than above, and with two contiguous black spots above anal angle; extreme bases of both wings beneath edged with carmine. Head and pronotum black, the last with a narrow anterior carmine collar; abdomen above fuscous, with the segmental incisures ochraceous and the anal valves greyish; thorax beneath and legs black; abdomen beneath yellow.

\* Prof. Westwood has made some true observations on this point:—"Another difficulty, unknown to the older writers . . . has arisen from the exploration of numerous adjacent localities, which, whilst it has added greatly to our knowledge of new and quite distinct species, has also shown that the wide geographical range of a species is often attended with the development of slightly modified races, which have by some writers been indifferently regarded as distinct species, or have been sunk to the rank of local varieties. Thus, of the gigantic types of the diurnal Lepidoptera, which, from their size, have been well named *Ornithopterus*, and which are natives of the East, we find the single species *Papilio Priamus*, in Mr. Kirby's Catalogue, made to comprise not fewer than seventeen of these local forms. These have been specifically named and regarded by others as distinct species" (Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 156).

† Amongst the most beautiful of the species may be mentioned the *O. urvilliana*, described by Guérin-Ménéville, in 1829, from specimens obtained in New Ireland during the voyage of the 'Coquille,' and of which nothing more was known till 1877, when specimens were sent home from that island by the Rev. G. Brown. The male in this species is of a lovely blue colour. Another splendid species is the *O. cræsus*, discovered by Mr. Wallace in the island of Batchian, and described by that naturalist, the males of which are "velvety black and fiery orange." Mr. Wallace describes the excitement under which he first captured this entomological prize:—"On taking it out of my net, and opening the glorious wings, my heart began to beat violently, the blood rushed to my head, and I felt much more like fainting than I have done when in apprehension of immediate death" ('The Malay Archipelago, 3rd ed. p. 336). These are the sensations of the searchers for "hid treasures" in Palestine, and Dr. Thompson tells us that he has "heard of diggers actually fainting when they have come upon even a single coin" ('The Land and the Book,' p. 135).

Female. Larger than the male, the anterior wings with the greyish markings more distinct, the posterior wings above possessing a submarginal series of large black spots, the basal black area larger than in male, and occupying base of cell, and continued for about half the length of cell between the median and submedian nervures, an irregularly shaped black spot at anal angle; posterior wings beneath as above, but the black inner margin of cell continued and fused with the lower submarginal spot.

Exp. wings, ♂, 98 to 145 millim.; ♀ (one spec.), 145 millim.

HAB.—Continental India; Gudwal (coll. Dist.); Sikkim (de Nicéville).—Malay Peninsula; Perak (Künst.—coll. Semper); Selangor—Kwala Lumpur (Biggs—coll. Dist.).—Siam (Thomson—coll. Godm. and Salv.).



FIG. 106.—*Ornithoptera rhadamanthus*, ♀.

Some confusion formerly existed as to the identity of this species, Boisduval's types, —derived from Cochin China and Manilla,—forming a composite species,\* of which the Philippine insect has been correctly separated by G. R. Gray under the name of *O. nephereus*. I am indebted to my friend Mr. O. Salvin for comparing my figure of the Perak female with those in his own collection from N. India, and which he writes me do not disagree. Mr. Salvin also writes, "*Ornithoptera rhadamanthus*, var. *Thomsonii*, Bates, ex Siam, is based upon two MALE specimens, which are hardly to be distinguished from *O. rhadamanthus* of N. India. The wings are rather more elongate, but the difference is very slight and not constant."

The male here figured (Tab. XXVII. a, fig. 5) is a very dwarfed form captured at Kwala Lumpur by the Rev. L. C. Biggs; the female (of which a woodcut is given) is a Perak specimen kindly lent me for examination by Herr Georg Semper, of Altona.

\* Boisduval distinctly describes the female as having on the posterior wings "la bordure précédée d'un rang de taches ovales," which agrees with what is here understood as his species, whilst he describes as his var. A, a "femelle ayant la bordure entièrement confluyente avec les taches," which entirely denotes the Philippine species renamed by G. R. Gray.

2. *Ornithoptera hephæstus*. (Tab. XXVII., fig. 3 ♂, 4 ♀.)

*Papilio Hephæstus*, Felder, Reise Nov. Lep. i. p. 16, n. 8 (1865).

*Ornithoptera Leda*, Wall. Trans. Linn. Soc. vol. xxv. p. 39, n. 8 (1865).

Male. Anterior wings velvety black, the outer marginal fringe alternately greyish-white and black; posterior wings bright pale golden yellow, the neuration, outer margin (inwardly scalloped), abdominal margin, and basal area—crossing upper end of cell and terminating on costal margin beyond middle of costal nervure—black. Wings beneath as above; anterior wings generally with the median nervules more or less margined with greyish; posterior wings with the portion of the scalloped margin situate between the second and third median nervules broken and maculate, and with a notched black spot on abdominal area a little above anal angle. Body above with the head and pronotum black, the last with an anterior carmine collar; abdomen above fuscous, the segmental incisures ochraceous, and with a basal central pale fascia; thorax beneath and legs black, the first with its margins at bases of wings carmine; abdomen beneath yellow.

Female. Larger than the male, the posterior wings above with a submarginal series of black spots, the one between the second and third median nervules touching the scalloped margin, two large spots—sometimes fused into an elongate patch—at anal angle. Wings beneath as above; the anterior wings with the neuration more or less obscurely margined with greyish, and sometimes with a distinct greyish patch near posterior angle, the spots on the posterior wings sometimes narrowly margined with bluish-grey.

Var. *a*. ♂. Posterior wings with the scalloped margin between the second and third median nervules broken and macular as beneath, and with a more or less distinct submarginal series of minute black spots placed between the nervules—more distinct beneath than above.

Var. *a*. ♀. (Tab. XXVII., fig. 2.)

*Ornithoptera ruficollis*, Butl., ♀, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 1 (1877).

Anterior wings above sometimes black as in typical specimens (Tab. XXVII., fig. 4) or streaked with greyish at end of cell, and with the nervules more or less broadly margined with greyish; posterior wings with the submarginal row of spots larger.

Exp. wings, ♂, 140 to 150 millim.; ♀, 168 to 185 millim.

HAB.—Malay Peninsula; Province Wellesley (colls. Sauer and Dist.); Perak (Biggs—coll. Dist.).—Celebes (colls. Wallace, Felder, Gosse); Menado (coll. Dist.).

This is a race of the *O. pompeus*, Cram., and which has another closely allied race or species in the North Indian *O. cerberus*, Feld. Mr. Butler had described the female specimen in my own collection (Tab. XXVII., fig. 2) as the female of his *O. ruficollis*, but this is at once seen to be an error by the wings beneath having their bases carmine, a character not found in *O. ruficollis*.

b. *Extreme bases of wings beneath not fringed with carmine.*

3. *Ornithoptera ruficollis*. (Tab. XXVII., fig. 1 ♂.)

*Ornithoptera ruficollis*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 1 (1877), (part).

Male. Anterior wings velvety black; apex of cell, and the area above and beyond apex of cell elongately continued along the nervules, ochraceous; fringe alternately grey and white. Posterior wings bright and pale golden yellow, the neuration, costal, abdominal and outer margins—the last narrow and scalloped

internally—black; between the second and third median nervules the scalloped margin is continued as an elongate spot. Wings beneath as above, the markings on the anterior wings somewhat paler, brighter and more greyish. Head and pronotum black, with an anterior carmine collar; abdomen above pale yellow, the basal half tinged with brownish; thorax beneath and legs black; abdomen beneath pale yellow; anal valves greyish white.



FIG. 107.—*Ornithoptera ruficollis*, ♀.

Female. Anterior wings above velvety blackish, with the following greyish markings:—two large contiguous spots at end of cell, the area above and beyond apex of cell elongately continued along the nervules, and a spot near apex of second and third median nervules and of submedian nervure. Posterior wings above very bright and pale yellow; the neuration, a large basal transverse patch extending from base of cell to costal margin beneath the costal nervure, the abdominal margin, and the posterior margin inwardly scalloped and connected with a submarginal series of six large spots placed between the nervules, the three uppermost of which are irregularly rounded, the fourth, fifth and sixth pyriform, black; near the abdominal fold and above the submedian nervure the ground-colour is dusted with dark greyish. Wings beneath as above, but the greyish markings on the anterior wings paler beneath, and the posterior wings not dusted with dark greyish near abdominal margin. Body above with the head and pronotum black, the last with a narrow carmine collar; abdomen above greyish-brown; abdomen beneath with about half of its lateral margin bright yellow; thorax beneath and legs black.

Var. *a*. ♀. (Tab. XXVII. *a*, fig. 1.)

Differs from typical form of *O. ruficollis* by having the submarginal row of spots to the posterior wings distinctly separated from the posterior margin.

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Exp. wings, ♂, 115 to 137 millim.; ♀, 140 to 155 millim.

HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.); Province Wellesley (coll. Dist.); Perak (Künstler—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.).

As already explained (*antea*, p. 328), when Mr. Butler described this species the true female had not been received, and he described a specimen in my own collection as being the missing sex of *O. ruficollis*. Since then, by the kind assistance of Dr. Anderson, I have been able to examine a fine series of both sexes, and no mistake can be made if the bases of the wings beneath are consulted, as in *O. hephaestus* these are tinged with carmine—a character totally absent in *O. ruficollis*.

B. *Outer margin of anterior wings nearly straight.*

4. **Ornithoptera brookeana.** (Tab. XXVII. *b*, fig. 1 ♂; XXVII. *a*, fig. 4 ♀.)

*Ornithoptera Brookiana*, Wallace, Proc. Ent. Soc. ser. 2, vol. iii. p. 104 (1855).

*Ornithoptera Brookeana*, Hew. Ex. Butt. i. *Orn. & Pap.* t. 1, f. 1 (1855); Wall. Trans. Linn. Soc. vol. xxv. p. 40, n. 16 (1865); Gosse, Ent. vol. xiv. p. 156 (1881); Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 291. t. 27, f. 5-8 (1882).

*Papilio Brookeana*, Snell. Lep. v. Midd. Sum. p. 24, n. 1 (1880).

*Papilio Trogon*, Voll. Tijd. Ent. iii. p. 69, t. 6 (1860).

Male. Wings above velvety black, the fringe narrowly greyish; anterior wings with a series of seven large submarginal lanceolate, metallic, emerald-greenish spots, broadest inwardly, and each centrally divided by the neuration, the uppermost smallest and situate on the lower subcostal nervule, the seventh broadest and divided by the submedian nervure; posterior wings with the disk from near base to about one-third beyond cell metallic emerald-greenish, divided by the black neuration. Wings beneath black, but more opaque than above; anterior wings with the greenish spots smaller and more obliterated than above, followed by some more or less distinct greyish duplex spots divided by the nervules, the basal costal area, and a broad curved streak beneath base of cell, metallic-blue; posterior wings with some metallic-bluish spots at base, and with a broad submarginal greyish fascia, which is outwardly lunate and inwardly more or less effectively encloses a series of black spots. Body and legs black, base of head above and a broad pronotal collar dark brilliant carmine; thorax beneath with the posterior margins of the meso- and metasternums, and a maculate tuft on each side of base of abdomen dark brilliant carmine.

Female. Wings above less intense and brilliant black than in the male, the anterior wings also differing in having the emerald-green spots replaced above the lower discoidal nervule by a large subapical greyish-white patch, divided by the black nervules and outwardly deeply and acutely cleft; posterior wings with the discal emerald-greenish patch having the dividing neuration more broadly blackened, shaded with bluish at base, and outwardly bordered by a submarginal lanceolate dark greyish fascia, which is palest towards apex; wings beneath paler and more fuscous than above; anterior wings with the emerald spots above as well as the subapical patch greyish-white beneath, those beneath the cell inwardly tinged with greenish, the metallic-blue markings as in male; posterior wings with a broad submarginal greyish-white fascia, outwardly lunate and inwardly more or less effectively enclosing a series of spatulate dark spots. Body above with the pronotal collar less broadly carmine than in male, the abdomen dark olivaceous-brown; abdomen beneath blackish, the sternum and base of abdomen marked with carmine as in male.

Exp. wings, ♂, 166 to 172 millim.; ♀, 172 to 180 millim.

HAB.—Malay Peninsula; Perak (coll. Gosse; Künstler—Calc. Mus.; Lowe—coll. Dist.); Malacca



(Biggs—coll. Dist.); Johore (Annesley).\*—Sumatra (Snellen).—Borneo; Sarawak (Wallace); Sandakan (Pryer); Banjermasin (coll. Dist.).

This very beautiful butterfly holds an intermediate position between the subgenera *Ornithoptera* and *Papilio*, but, as argued by Mr. Wallace, it agrees with *Ornithoptera* “in the form and stoutness of the wings, the long, stout and curved antennæ, the red collar and patches at the base of the wings beneath, the abdominal fold, and the flight and general appearance.”† For many years the female was quite unknown, and though contained in some very few collections was subsequently first described by Mr. P. H. Gosse.‡ It is still, however, exceedingly scarce. Mr. Low, the Resident at Perak, through whose kind assistance the first examples of this species from the Peninsula reached my hands, wrote to Mr. Logan that the specimens were all males, as “the females are rarely met with.” Two females only have passed through my hands, one belonging to Mr. Godfery, and the other (now contained in my own collection) having been captured by Mr. R. D. Hewett at Kinta, in Perak, and that the only example amidst a collection of some hundred male specimens. Herr Künstler, who has spent some time in Perak collecting Natural-History specimens, has forwarded me the following information as to the species:§—“During the last five years I have caught over a thousand males, and about fifteen females only. On some days the males are very plentiful; a man may catch as many as fifteen to twenty in a day. On other days they are not to be seen. I have only seen them in the Kinta district in Perak nearly all the year round, but principally in March, April, May and June, in showery weather, when they are to be seen flying over muddy streams (coming from the tin mines) with overhanging jungle. They generally resort to spots where there is decayed animal matter, and may, in fact, be enticed to those spots if the same is suitably prepared. Have never bred any, but have once observed a female laying one egg on a creeper;—the egg was lost on my removing. The female is so scarce that during the three months in which, with the assistance of three men, I obtained over 800 males, I did not get a single female, and only saw during that period from twenty to thirty females, which were flying high and settled only on flowers on high trees. The bait which attracted the males never attracted the females, which fly mostly by themselves, and seldom near the males, excepting when the latter are in pursuit of them.”

Mr. F. W. Burbidge, during his travels in Borneo, observed this species in abundance. He writes:—“Now and then the most splendid *Ornithoptera* are seen, their strong and swift flight resembling that of a bird. One lovely fellow, fully six inches across the wings, settled on my boot as I remained motionless watching it. . . . These delicate insects are generally most numerous by rivers, or in sunny places by the dry beds of streams, and, singularly enough, are most abundant during the cool wet monsoon.”||

This butterfly, in the male sex at least, will soon be a drug in collections. Thousands have been recently sent to Europe, and I was lately told by an extensive cabinet and

\* I record a capture of the species at Johore on the authority of a communication from Mr. Godfery.

† Trans. Linn. Soc. vol. xxv. p. 41 (1866).

‡ ‘Entomologist,’ vol. xiv. p. 156 (1881).

§ This information was forwarded in 1883.

|| ‘The Gardens of the Sun,’ p. 260.

furniture maker that he had been offered a large quantity at a low rate for the decoration of screens! \*

### Subgenus PAPILIO.

The principal diagnostic characters of *Papilio* have already been given (*antea*, p. 324), and the characters by which *Ornithoptera* differs in a subgeneric sense have also been described (*antea*, p. 325), so that it only remains to give the structural characters of the groups into which *Papilio* is divided.

One great feature in *Papilio* is the extraordinary diversity of coloration found among its species. Even in this fauna we have melanic types, like *P. pammon*, *P. iswara*, and others, whilst in *P. antiphates* we have a totally dissimilar and paler coloration. The whole question as to the coloration of insects is still extremely obscure, though a new theory is sometimes advanced. †

In the tropics the Papilios form no inconsiderable portion of the principal feature of butterfly existence. Dr. Hooker vividly describes their abundance and appearance near Darjeeling. "They were seen everywhere, sailing majestically through the still hot air, or fluttering from one scorching rock to another, and especially loving to settle on the damp sand of the river-edge; where they set by thousands, with erect wings, balancing themselves with a rocky motion, as their heavy sails inclined themselves to one side or the other; resembling a crowded fleet of yachts on a calm day. Such an entomological display cannot be surpassed." ‡ In Angola, Mr. Monteiro found the finest Papilios, in contrast to the shade-loving habits of some other genera, "only in the full sunshine, on the low bushes and flowering plants, skirting, as with a broad belt, the woods or forest." § On the contrary, however, Mr. Bates, when in South America, and in the rich rhopaloceros region of Pará, found "those species of *Papilio* which are most characteristic of the country, so conspicuous in their velvety-black, green, and rose-coloured hues . . . . never leave the shades of the forest." || Doubleday

\* It is surprising how many living creatures are almost exterminated by man for his gratification in ornamentation, or to satisfy his utilitarian propensities. Quite recently, in this country the robin was slaughtered to provide a head-dress for ladies, and at the present time the hats and bonnets of our female friends are frequently decorated with the skin of some tropical bird. At the Norfolk Broads the angler catches the bream for sport, and often consigns them to the cottager to manure his garden; whilst at Skomer Island, we have recently learnt from the Rev. M. A. Mathew, that multitudes of shearwaters are "destroyed by the farm servants, and the bodies of the birds ploughed into the ground as a dressing for wheat" ('Zoologist,' ser. 3, vol. viii. p. 435). Even man does not spare his fellow in this civilizing process, as in the time of the great French Revolution, when, as Carlyle tells us, the hair of the guillotined was used for the manufacture of "*perruques blondes*," and quotes Montgaillard that at Meudon "there was a tannery of human skins; such of the guillotined as seemed worth flaying; of which perfectly good wash-leather was made."

† One of the most important suggestions on this subject has recently been formulated by Lord Walsingham ("On some probable causes of a tendency to melanic variation in Lepidoptera in high latitudes," the annual Presidential Address to the Yorkshire Naturalists' Union, Doncaster, March 3, 1885). In discussing the probable explanation of the white covering of many Arctic and Alpine mammals and birds, and the dark hue of many lepidopteral species in the same habitats, he has accepted the views set forth at least by Craven in 1846, as explanatory of the first phenomenon, which accounts for the same by the well-known fact of white being a bad radiator of solar energy, and white-covered animals thus being able to retain their heat to the greatest advantage. The dark insects, on the contrary, are considered to have their advantage in being better able to absorb the solar radiation. Mr. Meldola has well summarised these views in the following words:—"In the case of warm-blooded animals the loss of heat by radiation is retarded by the white covering, whilst in insects, which develop but little heat by respiration, it is of the utmost importance to utilize as much as possible of the solar energy" ('Nature,' vol. xxxi. p. 505). An excellent *resumé* of Lord Walsingham's theory has been given by Mr. J. Jenner Weir ('Entomologist,' vol. xviii. p. 81).

This theory throws little light, however, on the coloration of tropical butterflies, a question still requiring suggestions for a solution.

‡ 'Himalayan Journals,' vol. i. p. 143.

§ 'Angola,' vol. i. p. 171.

|| 'The Naturalist on the Amazons,' 3rd edit. p. 52.

observed several species to "take long circuits, returning after the lapse of a few minutes in the same direction, and often in precisely the same track they have just passed over. I have often, in the old cotton-fields of East Florida, waited by the side of a large bush of some *Vaccinium*, or *Andromeda*, for a specimen of *P. ajax*, which I had seen pass it; and my patience in remaining quiet for a few minutes has mostly been rewarded by its capture."\*

As already remarked (*antea*, p. 322), *Papilio*, although treated here as a single genus, possesses structural characters which in other families have been—and by myself in this work—used to denote generic separation, and though several lepidopterists are now proposing this course with *Papilio*, the work has been already exhaustively done by C. and R. Felder in their 'Species Lepidopterorum,' in which the structural details which separate their sections and subsections are fully and carefully given, so that the work of the generic creator in *Papilio* is almost merely that of a proposer of new generic names. I have also followed the method of specific grouping proposed by Mr. A. R. Wallace in his well-known memoir, "On the Papilionidæ of the Malayan Region."

Prof. Wood-Mason has drawn attention to "mimicry" among several Indian species which belong to "scentless" groups, and which "mimic" other species belonging to "strong-scented and nauseous" groups. †

#### NOX Group.

a. *Nox*-group, Wallace (part), ‡ *Trans. Linn. Soc.* vol. xxv. p. 23 (1865).  
Sect. LXVI. et LXVII., Felder, *Spec. Lepid. Pap.* pp. 37, 84-5 (1864).

Abdominal fold in ♂ very large; anal valves small but swollen; posterior wings simple or caudately produced.

This is a small group of obscurely coloured species, which is almost confined to the Indo-Malayan region, and particularly well represented in the island of Borneo. The females are larger and always somewhat more brightly coloured than the males. In the Philippine species *P. semperi*, Feld., the posterior wings are caudately produced. §

Two species only are known to the writer as found in the Malay Peninsula. A third—*P. nox*, Swains.—has been recorded by Mr. Wallace as found at Penang, on the authority of a male specimen contained in the British Museum, but this appears to be incorrect, as Mr. Butler, who kindly looked into the matter for me, writes "locality Penang is not attached to our ♂ *P. nox*, and does not exist in our Register. The specimen was presented by Dr. J. Hooker."

\* *Gen. Diurn. Lep.* vol. i. p. 7.

† *Ann. & Mag. Nat. Hist.*, February, 1882, p. 103. Mr. Wood-Mason in this paper promised a more exhaustive memoir on the subject, "Notes on the Phenomena of Mimicry, as exemplified by the Papilionidæ of our North-eastern Indian Possessions," a publication which has not yet appeared.

‡ Mr. Wallace proposed to include here the "Indian *Philo xenus*-group, but this seems better treated separately as by the Felders in a separate section (Sect. LXIX.—*Spec. Lepid. Pap.* pp. 37 and 86), since generically named *Byasa* by Mr. Moore (*Proc. Zool. Soc.* 1882, p. 258).

§ Mr. Wallace has also given the larval characters of this and the two following—*Coon* and *Polydorus*—groups, as "Larvæ short, thick, with numerous fleshy tubercles; purplish." I have not relied on these characters, as the life-history of all the butterflies included in the groups are not known; and though analogous reasoning would point to a similarity of larval character, we must not forget that in nature it is the unexpected that is so frequently discovered.

1. *Papilio erebus*. (Tab. XXXI., fig. 1 ♂, 2 ♀.)

*Papilio Erebus*, Wallace, Trans. Linn. Soc. vol. xxv. p. 41, n. 19 (1865).

*Papilio Nox*, var., De Haan, Verh. Nat. Ges. Ned. overz. Bez. p. 41, t. 5, f. 3 (1840).

*Papilio Nox*, Gray (part), Cat. Lepid. Papil. p. 8, n. 28 (1852).

Male. Anterior wings above dark indigo-black; posterior wings dark olivaceous; anterior wings beneath with the neuration beyond cell margined with pale obscure fuscous, the inner margin more or less olivaceous; posterior wings beneath darker than above. Body above more or less concolorous with wings; pronotum with a villose carmine collar; thorax beneath and legs blackish, the lateral margins at extreme base of wings brilliant carmine; abdomen beneath dark fuscous.

Female. Much larger than the male; wings above more or less concolorous with those of the male, but the anterior wings having the median nervules margined with pale fuscous, and the remainder of the neuration beyond cell (excluding extreme apex) margined with greyish-white; posterior wings with the posterior margin distinctly scalloped, the fringe greyish-white, and with a series of large dark lanceolate marginal spots placed between the nervules; wings beneath as above, but the anterior wings having all the nervules margined with pale greyish-white, and the apical half of cell also inwardly more or less distinctly margined with the same colour; posterior wings having the apices of the nervules at posterior margin obscurely bordered with greyish. Body coloured as in male, but with a carmine tuft between the eyes and the apex of the abdomen beneath of the same colour.

Exp. wings, ♂, 85 to 98 millim.; ♀, 121 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (coll. Wallace).—Borneo; Banjermasin (De Haan).

An opportunity has now been afforded of figuring what appears to be both sexes of this scarce species.\* Prof. Westwood, in recently describing some new species belonging to the group, also gave a description of what he considered the female *P. erebus* as "black above," which, with other characters enumerated† do not apply to the species.†

2. *Papilio varuna*. (Tab. XXXI., fig. 3 ♂, 4 ♀.)

*Papilio Varuna*, White, 'Entomologist,' i. p. 280 (1842); Gray, Cat. Lepid. Papil. p. 8, n. 27 (1852);

Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 98, n. 199 (1857); Wall. Trans. Linn. Soc. vol. xxv. p. 42, n. 20 (1865); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 20 (1877).

*Papilio Chara*, Westw. Ann. Nat. Hist. ix. p. 37 (1842); Arc. Ent. ii. t. 66, f. 2 (1844).

*Papilio Astorion*, Westw. Ann. Nat. Hist. ix. p. 37 (1842); Arc. Ent. ii. t. 66, f. 1 (1844).

Male. Anterior wings above dark glossy blackish, with an olivaceous tinge, and with a few greyish streaks near outer angle (these are absent in some specimens); posterior wings dark shining olivaceous; anterior wings beneath as above, but with a series of longitudinal greyish strigæ on outer half of wing, faintest at apex and most distinct and palest at outer angle; posterior wings darker and blacker than above. Body above blackish; an anterior pronotal collar and tuft between the eyes carmine; body beneath blackish; lateral margins of the thorax, and a large basal tuft to the abdomen carmine; abdomen beneath carmine, spotted with black; legs blackish.

Female. Considerably larger than the male. Anterior wings above blackish, irrorated with obscure greyish, the last colour most distinct and prominent near the submedian nervure; posterior wings as in male; wings beneath as in male, but the anterior wings having the greyish markings larger, more numerous, and distributed over the whole area of wing. Body as in male.

\* Both sexes have been received together, and presumably represent one species, despite several and not inconsiderable differences.

† Trans. Ent. Soc. Lond. 1872, p. 93.

Exp. wings, ♂, 104 to 110 millim.; ♀, 133 millim.

HAB.—Continental India; Sikkim (coll. Dist.); Darjeeling (Horsf. & Moore).—Malay Peninsula; Penang (Brit. Mus.); Province Wellesley (colls. Säuer and Dist.); Malacca (Pinwill—Brit. Mus.).

Some difference of view exists as to the priority of the nomenclature of this species. Mr. Kirby\* records it under the name proposed by Prof. Westwood,—*P. astorion*,—but, after perusing the explanatory note or almost pathetic remonstrance of Adam White,† there seems scarcely any doubt that the usual course, and that followed by most writers, of giving White's name priority, is inevitable.

#### COON † Group.

b. *Coon*-group, Wallace, Trans. Linn. Soc. vol. xxv. p. 23 (1865).

Sect. LXXI. & LXXII., Felder, Spec. Lepid. Pap. pp. 38, 86 (1864).

Abdominal fold in male small; anal valves small but swollen; posterior wings caudately produced.

This section embraces a small group of species which are found in Continental India, the Andaman Islands, Burma, the Malay Peninsula, and the islands of the Indo-Malayan Region.

These butterflies have a distinct facies by their elongately produced wings, the posterior of which are caudately developed. Two species have been received from the Malay Peninsula.

### 3. *Papilio neptunus*. (Tab. XXXIII., fig. 5 ♂, 6 ♀.)

*Papilio Neptunus*, Guérin, Deless. Souv. Inde, ii. p. 69 (1843); Wall. Trans. Linn. Soc. vol. xxv. p. 42, n. 22 (1865); Gray, Cat. Lepid. Papil. p. 15, n. 19 (1852); Druce, Proc. Zool. Soc. 1873, p. 357, n. 8; Oberth. Études d'Ent. Quatr. Livr. p. 45, n. 62 (1879); Kheil, Rhop. der Insel. Nias, p. 36, n. 138 (1884).

*Papilio Satarnus*, Guér. Deless. Souv. Inde, ii. t. 19 (1843). §

Male. Anterior wings above blackish, with two long transverse greyish patches, the first and most distinct crossing cell, the other near apex; posterior wings black, with four contiguous red spots above anal angle, one small above the upper median nervule, the two largest divided by the second median nervule and the fourth, minute, beneath the lower median nervule; caudate prolongation long and slender, black. Wings beneath as above. Body above and beneath with legs black; abdomen with nearly apical half ochraceous, lateral margins of thorax beneath at extreme base of wings carmine.

Female. Wings broader than in male, the greyish patches to the anterior wings larger, paler and brighter; posterior wings with the uppermost red spot sometimes missing as in the specimen figured (fig. 6); caudate prolongation broader and more spatulate.

Exp. wings, ♂ & ♀, 95 millim.

HAB.—Malay Peninsula; Penang (coll. Oberth.; Biggs—coll. Dist.); Province Wellesley (coll. Dist. and Säuer); Perak (Künstler—Calc. Mus.); Malacca (Wallace).—Nias Island (Kheil).—Borneo (Druce and Wallace).

\* Syn. Cat. Diurn. Lep. p. 553, n. 227 (1871).

† Entomological Notices, p. 9.

‡ *P. coon*, Fabr., is a species found in Sumatra, Java, and Borneo, and is replaced on the continent by *P. doubledayi*, Wall.

§ Guérin's plate was lettered erroneously, the species being fixed by that author's description.

This does not appear to be an abundant species; it was not contained in the large collection made by Capt. Pinwill at Malacca, and has been included in very few of those sent home to the writer as contributory material for this work.

4. *Papilio doubledayi*. (Tab. XXXIII., fig. 4 ♀.)

*Papilio Doubledayi*, Wallace, Trans. Linn. Soc. vol. xxv. p. 42, note (1865); Oberth. Études d'Ent. Quatr. Livr. p. 45, n. 64 (1879); Gosse, Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 323, t. 32, f. 17, 18 (1882).

Female. Anterior wings above dark fuliginous, with dark fuscous streaks in cell and along and between the nervules; posterior wings black, with two white spots in cell, five similarly coloured spots beyond cell, of which two almost subquadrate are separated by the lower subcostal nervule, the other three oblong and divided by the median nervules, the innermost spot longest; three submarginal greyish spots divided by the lower subcostal and discoidal nervules and two red marginal spots, one at apex of second median nervule and the other at anal angle; caudate prolongation black. Anterior wings beneath as above; posterior wings as above, but with an additional spot in cell and two additional spots beyond cell, one between the discoidal and upper median nervules and one above the upper subcostal nervule, the lower submarginal greyish spot tinged with reddish, and an additional submarginal red spot between the first and second median nervules. Head and pronotum black, with an anterior pronotal collar and a tuft between the eyes carmine; abdomen above ochraceous, the base and some dorsal spots black; thorax beneath and legs black, lateral margins of the thorax at extreme base of wings carmine; abdomen beneath ochraceous, spotted with black.

Exp. wings, ♀, 125 millim.

HAB.—Continental India; Assam (Wallace); N.E. Himalayas (coll. Dist.).—Burma (coll. Dist.); Moulmein (Wallace).—Malay Peninsula; Province Wellesley (coll. Dist.).

This appears to be a very scarce *Papilio* in the Malay Peninsula, as I have only seen one specimen from that locality, and that an example from Province Wellesley in my own collection.\* I have given the description of that specimen, but the species would seem to be very variable, as I have Burmese examples in which the white spots in the cell of the posterior wings are amalgamated and the surrounding spots also larger, whilst in one specimen I possess, from the N.E. Himalaya, the spots in the cell are almost obsolete.

*POLYDORUS* † Group.

c. *Polydorus*-group, Wallace, Trans. Linn. Soc. vol. xxv. p. 23 (1865).

Sec. LXXIII., Felder, Spec. Lepid. Pap. pp. 87 (1864).

*Menelaides*, Hübner, Verz. bek. Schmett. p. 84 (1816); Moore, Lep. Ceyl. vol. i. p. 151 (1881).

Abdominal fold in male small, or none; anal valves small or obsolete, hairy; posterior wings simple or caudately produced.

This is a somewhat larger group of species, the distribution of which is focussed in the Malayan Archipelago, throughout which region it is found. One species only is known from the Malay Peninsula.

\* Since this was written I have been advised by Mr. Walter Egerton of a specimen taken at the Langkawi Islands, off the coast of Quedah.

† *P. polydorus*, Linn., is a species found in many of the eastern islands of the Malay Peninsula, but not in this fauna.

5. *Papilio aristolochiæ* var. *diphilus*. (Tab. XXXI., figs. 6 & 7 vars.)

*Papilio Aristolochiæ*, Fabricius, Syst. Ent. p. 443, n. 3 (1775); Butl. Cat. Fabr. Lepid. p. 258, n. 78 (1869); Moore, Proc. Zool. Soc. 1878, p. 840.

*Papilio Polidorus*, Cram. Pap. Ex. ii. t. 128, A, B (1779).

*Papilio Polydorus*, Jabl. Naturs. Schmett. ii. t. 15, f. 3 (1784); Godt. Enc. Méth. ix. p. 71, n. 130 (1819); Boisd. Spec. Gén. i. p. 267, n. 90 (1836); De Haan, Verh. Nat. Ges. Ned. overz. Bez. p. 38, t. 8, f. 1 (1840).

*Papilio Diphilus*, Esper, Ausl. Schmett. t. 40 B, f. 1 (1785—1798); Hübn. Samml. Ex. Schmett. (1806—1816); Gray, Cat. Lepid. Papil. p. 10, n. 34 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 94, n. 190 (1857); Voll. Tijd. Ent. iii. p. 79, n. 73 (1860); Wall. Trans. Linn. Soc. vol. xxv. p. 43, n. 26 (1865); Moore, Proc. Zool. Soc. 1865, p. 756; Druce, Proc. Zool. Soc. 1874, p. 109, n. 8; Pryer, Ent. Mo. Mag. vol. xiv. p. 52 (1877); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 21 (1877); Proc. Zool. Soc. 1883, p. 153, n. 31; Gosse, Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 329, t. 33, f. 17—20 (1882).

*Menelaides Aristolochiæ*, Moore, Proc. Zool. Soc. 1882, p. 259.

*Papilio Adamas*, Zink. Nova. Acta. Ac. Nat. Cur. xv. p. 144 (1831).

*Polydorus Thoas*, Swains. Zool. Ill. Ins. ii. t. 101 (1833).

Male. Anterior wings above fuliginous, the basal area blackish, and the remaining area streaked with blackish, both in cell and between the nervules; posterior wings blackish, with five whitish spots beyond cell, the first and smallest situate above the discoidal nervule, the fifth between the lower median nervule and the submedian nervure, and a submarginal row of six reddish spots placed between the nervules, of which the upper three are the most obscure; a red spot above anal angle more or less fused with the inner whitish spot. Anterior wings beneath as above, but paler; posterior wings with the red spots larger and brighter than above, and with a small additional whitish spot within and just before end of cell (this spot is frequently visible above). Head and pronotum black, with an anterior pronotal collar and a tuft between the eyes carmine-red; abdomen red, spotted above and beneath with black; thorax beneath and legs black; lateral margins of the thorax at base of wings carmine-red.

Female. Resembling the male, but with the anterior wings broader, and the red submarginal spots to the posterior wings rather more obscure.

Exp. wings, ♂ & ♀, 70 to 90 millim.

HAB.—Continental India; N.W. Provinces (Swinhoe—Butler; N.W. Himalaya (Hocking—Moore); Bengal (Moore); Calcutta (Horsf. & Moore).—Burma; Moulmein (Limborg).—Tenasserim; Meetan, Hatsiega, Naththoung to Paboga (Limborg—Moore).—Malay Peninsula; Penang (coll. Dist.); Province Wellesley (colls. Säuer and Dist.); Perak (Künstl.—Calc. Mus.); Malacca (Pinwill—Brit. Mus.).—Siam; Naheonchaisee (Druce).—Java (Voll. and coll. Wallace).—China; Chekiang and Kiangsu Provinces (Pryer).

This is a very variable species, the race found in the Malay Peninsula being somewhat inconstant in character, especially by the presence or absence of the whitish spot in and near the end of cell of the posterior wing. When a series of specimens are examined, collected over a large area, and combining typical examples of *P. aristolochiæ* and *P. diphilus*, the difficulty of properly separating these forms seems to be insuperable, and Mr. Moore—who cannot be accused of too synthetic an arrangement of species—has recently published the two names as synonyms.\*

The flight of this butterfly has been differently described. Capt. de la Chaumette reports it (when observed in Continental India) as being “slow and heavy”; † whilst at Malacca the Rev. L. C. Biggs describes it as having “a curious hurried flight,” and that it “will often bear you company for quite a long distance upon the road, returning even after being

\* Proc. Zool. Soc. 1882, p. 259.

† Ent. Month. Mag. vol. ii. p. 37.

threatened with the net."\* Mr. L. de Nicéville states that the "species contains in itself the elements of protection in having a very strong somewhat rose-like odour, which is probably distasteful to birds." †

The larva and pupa of this insect were discovered by Horsfield in Java, drawings of which have been published. ‡ In India the larva is recorded as feeding on "*Aristolochia*." §

#### PERANTHUS Group.

e. *Peranthus*-group, Wallace, Trans. Linn. Soc. vol. xxv. p. 23 (1865).

Sect. LXIII., Sub-sect. C, Felder, Spec. Lepid. Pap. pp. 34, 83 (1864).

*Harimala*, Moore, Lep. Ceyl. vol. i. p. 145 (1881).

The characters of this and the four following groups are thus given by Mr. Wallace:—

"Larvæ with third segment swollen, transversely or obliquely banded; pupa much bent. Imago with abdominal margin in ♂ plaited, but not reflexed." Posterior wings often caudately produced.

This is a small and distinctly coloured group of Papilios, all more or less marked with metallic-greenish scales. *P. peranthus*, Fabr. (the name of which Mr. Wallace has applied to the group) is found in Java and some of the neighbouring islands, most of the other species being scattered throughout the Malayan Archipelago; the group is also represented in Continental India; one species is found in Ceylon and one in this fauna.

#### 6. *Papilio brama*. (Tab. XXXII., fig. 4 ♂.)

*Papilio Brama*, Guérin, Rev. Zool. 1840, p. 43, t. 1, f. 3, 4; Deless. Souv. Inde, ii. p. 71 (1843); Wall. Trans.

Linn. Soc. vol. xxv. p. 46, n. 39 (1865); Druce, Proc. Zool. Soc. 1873, p. 357, n. 15.

*P. Palinurus*, De Haan (nec Fabr.), Verh. Nat. Ges. Ned. overz. Bez. p. 28, t. 7, f. 3 (1840).

Male. Wings above fuscous, thickly covered with minute greenish scales; anterior wings with a transverse metallic-greenish fascia crossing wing at end of cell—where it is narrowest—and reaching inner margin near outer angle—where it is broadest; posterior wings with a similarly coloured fascia crossing wing from between the subcostal nervules—where it is broadest—to the abdominal margin near anal angle—where it is narrowest; a dark spot lunulated with dull red and violaceous at anal angle, and a marginal series of greenish lunulate spots; caudate appendages dark fuscous. Wings beneath dark brownish, somewhat thickly covered with minute ochraceous scales; anterior wings with a broad pale brownish fascia transversely crossing wing near apex—broadest at costal margin and narrowest at outer angle; posterior wings with the outer margin paler and containing a marginal series of dark lunulate spots irrorated with dull reddish and violaceous, the spot at apex inwardly greyish-white. Body above and beneath with legs more or less concolorous with wings.

Female. Resembling the male, but larger, and with the metallic-greenish fascia to the anterior wings narrower.

Exp. wings, ♂, 88 to 90 millim.; ♀, 100 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Biggs—coll. Dist.).—Sumatra (Wallace).—Borneo (Druce).

This was considered one of the rarest species when the writer collected in the Peninsula. A female Malaccan specimen sent home by the Rev. L. C. Biggs had this

\* Month. Packet, vol. ii. p. 191 (1881).

† 'The Asian Sporting Newspaper,' vol. iv. p. 175 (1880).

‡ Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. t. 11, f. 5, 5a.

§ Capt. de la Chaumette, Ent. Month. Mag. vol. ii. p. 37 (1865).



label attached:—"On Bamboo in compound of Malay house, at 4.30 p.m., composing itself for the night."

### MEMNON Group.

f. *Memnon*-group, Wallace, Trans. Linn. Soc. vol. xxv. p. 23 (1865).

Sect. LXV., Sub-sect. C. Felder, Spec. Lepid. Pap. pp. 36, 83, 84 (1864).

*Iliades*, Hübn. Verz. bek. Schmett. p. 88 (1816); Moore, Lep. Ceyl. vol. i. p. 147 (1881).

This is one of the most typical and interesting groups in the Malayan *Papilioninae*, and is distributed from Continental India and the Malay Peninsula throughout the Malayan Archipelago. It is in relation to species of this group that Mr. Wallace first formulated his celebrated conclusions as to the dimorphism, trimorphism, and polymorphism in the character of the female sex, conclusions that were subsequently accepted and corroborated by Mr. Trimen, who made similar observations in South Africa, and since supplemented by Mr. W. H. Edwards in North America, who has shown seasonal variation in species belonging to that fauna.

One dominant species of this group, *P. agenor*,—and one found in this fauna,—has been recorded by Mr. Wallace\* as having two forms of the female; but since then Mr. Butler has treated one of these and two others as distinct species, considering he can separate the males, and that it is only the non-appreciation of the lesser differences observable in the male sex that has induced observers to consider them as one species.

The difficulty of deciding which of these views to accept (in the absence of exact breeding experiments) has been much enhanced to the writer by having to deal with *six distinct female forms*, if the view of *one species only* be adopted, whilst, on the other hand, a number of males have been submitted to Mr. Butler, who has discriminated three species, according to his view, and another since received varies sufficiently on these lines to be estimated as a fourth. This gives four males only to six females, and therefore, awaiting the decision of the breeder, I have adopted a tentative course here, treating the different forms as subspecies or distinctly recognised varieties,† and it is to be hoped that Mr. Biggs or Mr. Durnford will soon settle the question.

#### 7. *Papilio agenor*. (Tab. XXIX., fig. 1 ♀.)

*Papilio Agenor*, Linnæus, Mus. Ulr. p. 194 (1764); Syst. Nat. i. 2, p. 747, n. 14 (1767); Clerck, Icones, t. 15 (1764); Cram. Pap. Ex. i. t. 32, A, B (1775); Godt. Enc. Méth. ix. p. 28, n. 9 (1819); Aurivill. (part), Kongl. sv. vet. Akad. Handl. Band 19, no. 5, p. 18 (1882).

*Papilio Androgeus*, Wall. (part), Trans. Linn. Soc. vol. xxv. p. 47, n. 44 (1865); Oberth. (part), Études d'Ent. Quatr. Livr. p. 34, n. 11 (1879).

*Papilio Memnon*, Gray (part), Cat. Lepid. Papil. p. 13, n. 47 (1852); Horsf. & Moore (part), Cat. Lep. Mus. E. I. C. vol. i. p. 99, n. 202 (1857); Reak. (part), Proc. Ent. Soc. Phil. iii. p. 449 (1864).

Female. Anterior wings above pale fuscous, with dark longitudinal fuscous streaks in cell and between the nervules; about half of inner marginal area, and about half of outer marginal area

\* Under the name of *P. androgeus*, Trans. Linn. Soc. vol. xxv. p. 47, n. 44 (1865).

† *Papilio cenea*, an African butterfly, has been shown by the breeding experiments of Mr. Mansel Weale, to have four distinct forms, one male and three female, and Mr. Trimen, in commenting on this observation, remarks that "the males present the customary amount of variation" (Trans. Ent. Soc. Lond. 1874, pp. 131 & 137 *et seq.*)

greyish-white; a triangular carmine spot occupying base of cell, beneath which the base of wing is also black; posterior wings greyish-white, the basal and cellular areas, neuration, abdominal margin, and a submarginal row of large spots placed between the nervules (that at anal angle smallest), black; these spots are followed by marginal ochraceous coloration, which is also more or less distributed on the abdominal area. Anterior wings beneath as above, but paler; posterior wings as above, but with carmine basal spots and without the ochraceous marginal coloration. (Body mutilated.)\*

Male. I am not sure of this sex, but it is closely allied to the males of the following five species, subspecies, or varieties? and will be almost indistinguishable from them above, only differing? by the nature and arrangement of the spots to the under surface of the posterior wings.

Exp. wings, ♀, 155 millim.

HAB.—Malay Peninsula; Singapore † (Godfery).

One mutilated specimen, collected by Mr. Godfery at Singapore, is the only example I have seen from the Malay Peninsula.

#### 7a. *Papilio phœnix*, *n. sp.* or *var.*? (Tab. XXVII. b, fig. 7 ♀.)

Female. Anterior wings above fuscous, with the neuration and longitudinal streaks in cells and between the nervules blackish, a large triangular red spot occupying base of cell, a very small red spot beneath base of cell, and the basal area beneath cell black; posterior wings black, dusted with a few scattered bluish scales, beneath cell and from lower subcostal nervule to abdominal margin the colour is greyish-white, with the neuration blackish, the outer marginal area dull reddish, containing a submarginal series of large blackish spots (that above anal angle smallest), the posterior margin and anal angle also black. Anterior wings beneath as above, but paler; posterior wings as above, but with basal red spots and the submarginal black spots continued to apex, the two uppermost margined above with reddish. Body and legs dark fuscous.

Exp. wings, ♀, 140 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.).

A female specimen collected by myself in Province Wellesley, in 1868, is the only example which I possess or have observed in any other collection. For the reasons given above, it is here treated provisionally as a subspecies under a distinctive name; it may probably be proved *by breeding* to be a seasonal form or variety of *P. agenor*.

#### 7b. *Papilio cilix*, *n. sp.* or *var.*? (Tab. XXIX., fig. 4 ♂ & 5 ♀.)

Male. Wings above dark greenish, the anterior wings with the cellular area, basal area beneath cell, the neuration, and longitudinal streaks between the nervules blackish, and a reddish basal streak in cell; posterior wings brighter and paler greenish, the basal area, the neuration and longitudinal streaks between the nervules blackish, and an obscure reddish spot at anal angle. Anterior wings beneath paler greenish, the neuration, longitudinal streaks in cell and between the nervules and basal area beneath cell blackish, a triangular basal red spot in cell; posterior wings blackish, with basal red spots, the outer marginal area somewhat more opaque, containing a submarginal row of spots inwardly bordered with bluish-green placed between the nervules, and a marginal series of three spots situate between the discoidal nervule and the lower median nervule: a large subquadrate anal-angular space reaching the second median nervule reddish,

\* This description is taken from a badly mutilated specimen taken at Singapore.

† The writer has only recorded the locality from which he has received this form of the species, and is unable to quote the habitats given by other authors, as their treatment applies also to the following forms as varieties of *P. agenor*; a conclusion which may be correct, but is not yet verified.

containing two of the submarginal and one of the marginal spots, the anal angle also black. Body above more or less concolorous with wings.

Female. Anterior wings above as in *P. phoenix*, but with an obscure pale fascia near apex; posterior wings blackish, dusted with some scattered minute metallic-greenish scales, three large greyish-white spots separated by the first and second median nervules,—the uppermost more or less obsolete; these pale spots are followed by three large dark black marginal spots, the lowermost of which is posteriorly margined with red, a large reddish patch at anal-angular area, containing a rounded black spot with the extreme angle itself black. Anterior wings beneath as above, but paler, and with a greyish patch at inner margin and a smaller one beyond cell; posterior wings beneath as above, but darker, with basal red spots, the reddish patch at anal-angular area larger, a marginal series of large black spots placed between the nervules, the reddish patch also containing two submarginal spots; extreme anal angle black as above. Body and legs fuscous or black.

Exp. wings, ♂, 116 millim.; ♀, 147 millim.

HAB.—Malay Peninsula; Malacca (Biggs—coll. Dist.).

This interesting form, for the acquisition of which I am indebted to the exertions of the Rev. L. C. Biggs in Malacca, is closely allied—especially in the female sex—to *P. thunbergii*, Sieb.,\* a Japanese insect. Whether its position in relation to *P. agenor* is that of a distinctly specific or varietal character is, as stated before, a perfectly open question, and one awaiting solution.

7c. *Papilio esperi*. (Tab. XXVIII., fig. 1 ♂, † and 6 ♀.)

*Papilio Esperii*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 17, t. lxviii. fig. 7 (1877).

*Papilio Protenor* (part), Esper (nec Cramer), Ausl. Schmett. t. 29, f. 2 (1785–98).

Male. Wings above and beneath resembling those of *P. citix*, but the posterior wings beneath having the marginal spots continuous and inwardly bounded by more or less distinct reddish lunules, the spots in the red anal-angular area also much larger.

Female. Resembling the male above, but with the anterior wings dark greyish, the basal area, neuration, and longitudinal streaks between the nervules black, and with a large diffused broad subapical whitish fascia. Posterior wings as in male, but with a reddish spot at anal angle, and sometimes a smaller but similarly coloured spot on posterior margin between the third median nervule and submedian nervule. Anterior wings beneath as above; posterior wings beneath as in male, the spots in the red anal-angular patch somewhat smaller, and the red submarginal lunules obsolete.

Exp. wings, ♂, 145 millim.; ♀, 140 to 155 millim.

HAB.—Malay Peninsula; Quedah (coll. Dist.); Province Wellesley (coll. Sauer); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.).

7d. *Papilio mestor*. (Tab. XXVIII., figs. 2 ♂, †, ‡ 7 ♀.)

*Iliades Mestor*, Hübner, Verz. bek. Schmett. p. 89, n. 931 (1816).

*Papilio Mestor*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 18 (1877).

*Papilio Androgeos*, ♂, Cram. Pap. Ex. i. t. 91, f. A, B (1779) ?.

\* Considered a synonym of *P. agenor* by Mr. Kirby (Syn. Cat. Diurn. Lep., Suppl. p. 810, 1877); and treated as a synonym of *P. memnon* by Mr. Elwes (Proc. Zool. Soc. 1881, p. 873).

† As proposed by Mr. Butler.

‡ As proposed by Mr. Butler. The under surface of the posterior wings only given.

Male. Resembling *P. esperi*, but the under surface of the posterior wings having a more or less distinct double row of marginal spots, the innermost being bounded by bluish lunules.

Female. Resembling *P. esperi*, but the anterior wings having the white subapical fascia absent and transferred to the inner marginal area; posterior wings having the reddish anal-angular patch larger than in *P. esperi*, and containing a dark spot. Wings beneath as in *P. esperi*, but with the corresponding differences as above.

Exp. wings, ♂, 130 to 140 millim.; ♀, 142 millim.

HAB.—Malay Peninsula; Quedah (coll. Dist.); Province Wellesley (coll. Säuer); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (coll. Godfery).

These last five species? or varieties? here described and figured exhibit in a marked degree the gradual transference of the male characteristics to the female sex. *P. agenor*, ♀, and *P. phoenix*, ♀, show the strongest sexual divergence, whilst *P. cilia*, ♀, *P. esperi*, ♀, and *P. mestor*, ♀, more closely,—and in the order named,—approach the hue and markings of the male.

**7 e. *Papilio achates*.** (Tab. XXVIII., figs. 3 & 4 ♂, \* 5 ♀.)

*Papilio Achates*, Cramer, Pap. Ex. ii. t. 182, A, B (1779); Godt. Enc. Méth. ix. p. 64, n. 107 (1819); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 19 (1877).

*Papilio Memnon*, var. *Achates*, Druce, Proc. Zool. Soc. 1874, p. 109.

*Papilio Androgeos*, De Nic. J. A. S. Beng. vol. L. p. 53, n. 62 (1881),

Male. Differing principally from the same sex of the preceding species? or forms described by having the red anal-angular patch on the under surface of the posterior wings much more restricted.

Female. Anterior wings above resembling those of *P. phoenix*, ♀, but somewhat paler; posterior wings *caudately produced*, creamy white, the neuration (broadly), a basal patch occupying nearly half of cell, a broad submarginal fascia,—widest and terminating at the median nervules,—anal angle and a spot above it on abdominal margin, and the caudate appendages, black; a patch on abdominal margin (containing the black spot), two marginal lunulate spots divided by the median nervules, and sometimes more obscure marginal lunulate spots extending to apex, reddish; fringe of both wings greyish. Wings beneath as above, the posterior wings with red basal spots. Pronotum and head black; abdomen above yellowish-grey, with a dorsal blackish fascia; body beneath and legs fuscous or black.

Exp. wings, ♂, 130 millim.; ♀, 145 to 154 millim.

HAB.—Continental India; Sikkim (de Nicéville).—Malay Peninsula; Quedah (coll. Dist.); Penang (Biggs—coll. Dist.); Province Wellesley (coll. Säuer); Malacca (Pinwill—Brit. Mus.).—Siam; Chentaboon (Druce).

The question whether this is merely another female form of *P. agenor* requires solution. Evidence in favour of its being so is found in the statement of Wallace,† that in a closely allied species, *P. memnon*,‡ “the males, the tailed and tailless females, have all been bred from a single group of the larvæ by Messrs. Payen and Bocarmé in Java.”

\* As proposed by Mr. Butler. The under surface of the posterior wings only given.

† Trans. Linn. Soc. vol. xxv. p. 6 (1865).

‡ *P. memnon* is closely allied to *P. agenor*, and represents the insular species, whilst *P. agenor* is the continental form.

## HELENUS Group.

g. *Helonus*-group, Wallace, Trans. Linn. Soc. vol. xxv. p. 49 (1865).

Sect. LX., Sub-sect. B, Felder, Spec. Lepid. Pap. pp. 31, 79 (1864).

*Charus*, Moore, Lep. Ceyl. vol. i. p. 149 (1881).

This is a somewhat extensive group of sombre-hued Papilios, which are distributed from Continental India to the confines of the Malayan Archipelago. Four species are found in this fauna, the sexes of which are more or less similar, but other species are contained in the group in which the greatest sexual dissimilarity is manifest. Prof. Wood-Mason, remarking on this fact, infers "the probable descent of all the members of this group from an ancestor with tailless, rounded wings in both sexes, closely resembling *P. dravidarum*,\* but with diffused discal markings in the hind-wings, and probably also in the fore-wings; the conspicuous wing-blotches of *P. helenus*, *P. castor*,† &c., having apparently resulted from the concentration, so to speak, of such diffused colouring in the direction of the breadth of the wing, just as have the discal bands of spots in *P. dravidarum* and *P. mahadena*‡ from a similar process of modification in the opposite direction."§

Mr. Wallace, who observed this group in their natural condition, states that *P. iswara*, and another species allied to *P. helenus*,|| "have an undulating flight, very like that of the South American Morphos, or even sometimes approaching that of the large *Noctuidæ*, and they rest with the upper wings deflexed over the lower."¶

8. *Papilio helenus*. (Tab. XXIX., fig. 3 ♂.)

*Papilio Helenus*, Linnæus, Mus. Ulr. p. 185 (1764); Syst. Nat. i. 2, p. 745, n. 4 (1767); Cram. Pap. Ex. ii. t. 153, A, B (1779); Clerck, Icones, t. 13, f. 2 (1764); Fabr. Syst. Ent. p. 443, n. 5 (1775); Spec. Ins. ii. p. 3, n. 7 (1780); Esper, Ausl. Schmett. p. 18, t. 2, f. 2 (1784); Jabl. Naturs. Schmett. ii. p. 166, n. 40, t. 14, f. 4 (1784); Godt. Enc. Méth. ix. p. 68, n. 117 (1819); Boisd. Sp. Gén. i. p. 211, n. 25 (1836); Gray, Cat. Lep. Papil. p. 18, n. 77 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 101, n. 205 (1857); Voll. Tijds. Ent. iii. p. 74, n. 28 (1860); Reak. Proc. Ent. Soc. Phil. iii. p. 464, n. 13 (1864); Wall. Trans. Linn. Soc. vol. xxv. p. 50, n. 56 (1865); Moore, Proc. Zool. Soc. 1865, p. 757; ibid. 1878, p. 840; Druce, Proc. Zool. Soc. 1873, p. 357, n. 13; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 13 (1877); Oberth. Études d'Ent. Quatr. Livr. p. 45, n. 68 (1879); Snell. Lep. v. Midd. Sum. p. 25, n. 7 (1880); De Nic. J. A. S. Beng. vol. L. p. 53, n. 60 (1881); Aurivill. Kongl. Sv. vet. Akad. Handl. Band 19, no. 5. p. 10 (1882); Gosse, Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 300, t. 29, f. 1—3 (1882); Kheil, Rhop. der Insel. Nias. p. 37, n. 140 (1884).

*Achillides Helenus*, Hübn. Verz. bek. Schmett. p. 85, n. 875 (1816).

*Charus Helenus*, Moore, Lep. Ceyl. vol. i. p. 149, t. 58, f. 3 (1881).

Male. Wings above blackish; posterior wings with three large, fused, discal, pale stramineous spots, separated by the subcostal nervules and a more or less obscure marginal series of reddish lunules not reaching the apical area. Anterior wings beneath with longitudinal greyish rays in cell, and an outer series of similar but broader greyish rays, becoming paler towards outer angle; posterior wings with the discal spots much whiter than above, the outer marginal series of reddish lunules continuous to apex, those at anal angle enclosing black spots, and above anal angle are two others, one being macular; fringe

\* A species found in Continental India.

† A Burmese species.

|| Probably the *P. prexaspes*, Feld.

‡ Another species found in Continental India.

§ J. A. S. Beng. vol. xlix. p. 149 (1880).

¶ 'Zoologist,' p. 4637 (1885).

and extreme outer margin alternately greyish-white between the nervules, greyish slender longitudinal rays in cell and basal area dusted with minute greyish scales. Body above black, the pronotal collar and base of head with minute greyish spots; body beneath blackish, the sternum spotted with greyish; legs blackish, the femora streaked with greyish.

Female resembling the male, but larger.

Exp. wings, ♂ and ♀, 120 to 144 millim.

HAB.—Continental India; Southern India (coll. Dist.); Sikkim (de Nic.); Bengal (Moore).—Ceylon (Moore).—Tenasserim; Hatsiega; Moolai to Moolat (Limborg—Moore).—Malay Peninsula; Penang; Province Wellesley (colls. Saüer and Dist.); Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.).—Sumatra (Snellen).—Nias Island (Kheil).—Java (Voll. and Oberth.).—Borneo (Druce); Banjermasin (coll. Dist.).—Philippines (Reakirt).—Celebes (Piepers).—China (Gray).

This widely distributed species appears to be of migratory habits, as I received in 1879 a specimen taken at sea during a calm, thirty miles from Singapore and nine from the nearest land.\* If during a calm one of these butterflies can be found so far at sea, it can be easily imagined that in such a region of sudden squalls and storms involuntary migration must frequently take place.

Herr C. Piepers, whose interesting observations of butterfly life in Celebes have been previously referred to, gives an interesting fact relating to this species:—"While I stood on the bank of the river, which forms at this spot an apparently still and very clear pool before entering the cleft in the rock, from which it reappears as a foaming and thundering waterfall, a specimen of *Papilio Helenus*, Linn., came flying over the water. Flying low, as is the habit of this species, it came within a short distance of me, when I saw it suddenly half close its wings and dive down close beside me, so that the whole body and about a third of the wings, which slanted upwards, were immersed; it then raised itself again out of the water and flew away."†

According to Mr. Wade, this species in Kandy, Ambogamua, and Kottawa forest, in Ceylon, "frequents high jungle only." Whilst, on the same island, Mr. Mackwood describes it as "found principally in open glades and roadways in the jungle, from about 2000 to 4000 feet."‡

I have received from Penang specimens of a large dragonfly and this species, labelled respectively by the Rev. L. C. Biggs "pursuer and pursued."

### 9. *Papilio iswara*. (Tab. XXX., figs. 1 ♂, 2 ♀.)

*Papilio Iswara*, White, Entom. i. p. 280 (1842); Doubl. Hew. Gen. Diurn. Lep. t. 2, f. 1 (1846); Gray, Cat. Lep. Papil. p. 19, n. 78 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. p. 101, n. 204 (1857); Wall. Trans. Linn. Soc. vol. xxv. p. 51, n. 58 (1865); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 15 (1877).

Male. Wings above black; anterior wings with obscure longitudinal brownish streaks in cell, and still more obscure streaks on outer area, the fringe narrowly spotted with whitish; posterior wings with a large whitish discal macular patch, divided by the nervules, and extending from costal margin, where it

\* I originally referred to this specimen, in error, under the name of *P. hystaspes*, a local form of *P. helenus* (Proc. Ent. Soc. Lond. 1879, p. xxx).

† Tijds. Ent. xix. pp. xviii to xxiv, and English translation by Kirby, 'Entomologist,' x. p. 268.

‡ Moore's 'Lepid. Ceylon,' vol. i. p. 149.

is narrowest, to the upper median nervule where it is broadest, more or less convex inwardly and obtusely dentate outwardly; between the spot and the abdominal margin are three small patches of whitish scales, a red lunulate spot above anal angle, and the fringe alternately white and black. Wings beneath less glossy black than above; anterior wings with the cellular margin, the longitudinal streaks in cell, and a series of streaks near outer margin greyish; posterior wings with the basal portion of the neuration, longitudinal streaks in cell, and some scattered scales between the costal and subcostal nervures greyish, the discal whitish patch narrowed and more macular, being divided by the black neuration, two lunulate greyish spots divided by the second median nervule, three lunulate bluish spots divided by the first and second median nervules and two red spots with black centres and outwardly margined with greyish, one a little before and the other a little above anal angle, the last containing an upper violaceous streak. Body above concolorous with wings, the pronotal collar spotted with greyish; body beneath with legs blackish or dark fuscous; a streak on inner side of eyes, posterior margin of head, some spots on prosternum, longitudinal streaks on femora, and some obscure abdominal spots, greyish.

Female. Larger than the male; anterior wings above with the longitudinal streaks paler, brighter, and more ochraceous-brown; posterior wings with the discal patch more stramineous than in male, and with two red spots with black centres, one a little before and the other a little above the anal angle; anterior wings beneath with the outer longitudinal streaks much broader than in male; posterior wings beneath with the markings larger and somewhat brighter than in male.

Exp. wings, ♂, 142 millim.; ♀, 152 millim.

HAB.—Malay Peninsula; Penang (Brit. Mus.); Province Wellesley (colls. Sauer and Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (coll. Wall.).—Borneo (Wall.).

*P. iswara* does not appear to be an abundant species, and is apparently almost confined to this fauna.

#### 10. *Papilio prexaspes*. (Tab. XXIX., fig. 2 ♂.)

*Papilio Prexaspes*, Felder, Reise Nov. Lep. i. p. 107, n. 82, t. 15, f. d (1865); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 14 (1877).

Male. Wings above black; posterior wings with a discal, pale stramineous, macular patch divided by the black neuration and extending from near the apex (where it is narrowest) to the upper median nervule (where it is broadest) inwardly somewhat convex and outwardly obtusely dentate; fringe alternately greyish and black; anterior wings beneath with cellular and outer brownish longitudinal streaks, and with a greyish spot near outer angle; posterior wings with the macular discal patch whiter than above, and between it and the abdominal margin are three lunulate greyish spots divided by the median nervules, followed by a series of more or less obscure bluish spots, and dark ochraceous marginal spots, which are almost completely obliterated from beneath the upper median nervule; a dark ochraceous spot above the anal angle; the fringe as above. Body above black, the pronotal collar spotted with greyish-white; body beneath with legs blackish; interior margin of eyes, basal margin of head, under surface of legs, and spots to thorax and abdomen, greyish-white.

Exp. wings, ♂, 110 millim.

HAB.—Malay Peninsula; Selangor—Kwala Lumpor (Biggs—coll. Dist.); Malacca (Com. de Castelnau—coll. Feld.; Pinwill—Brit. Mus.).

#### 11. *Papilio nephelus*, var. *saturnus* (Tab. XXX., figs. 3 ♂, 4 ♀, 5 ♀, var.)

*Papilio Nephelus*, Boisduval, Sp. Gén. i. p. 210, n. 24 (1836); De Haan, Verh. Nat. Ges. Ned. overz. Bez. p. 29, t. 4, f. 4 (1840); Wall. Trans. Linn. Soc. vol. xxv. p. 51, n. 61 (1865); Oberth. Études d'Ent. Quatr. Livr. p. 45, n. 66 (1879).

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*Papilio Saturnus*, Guérin, Deless. Souv. Ind. ii. p. 70 (1843); Feld. Verh. Zool. Bot. Ges. p. 320, n. 412, p. 367, n. 243 (1864); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 16 (1877).

*Papilio Neptunus*, Guér. Deless. Souv. Ind. ii. t. 18 (1843).\*

*Papilio Nephelus*, var. *Saturnus*, Gray, Cat. Lepid. Papil. p. 18 (1852).

Male. Wings above black; anterior wings dusted with minute bronzy scales, which form longitudinal rays in cell, a subapical transverse fascia of five pale stramineous spots divided by the nervules, and sometimes with a sixth very slender linear subcostal spot; outer margin with minute white spots between the nervules; posterior wings with a large discal macular pale stramineous patch divided by the nervules, extending from near costa—where it is narrowest—to the second median nervule, more or less convex inwardly, and outwardly strongly and obtusely dentate, principally produced between the discoidal and upper median nervules; fringe alternately greyish and black. Wings beneath as above, but the anterior wings with the subapical transverse macular fascia larger and whiter than above, and with two whitish spots near outer angle divided by the submedian nervure, the lowermost of which is very small; posterior wings with the discal macular patch whitish, and not pale stramineous as above, and continued to abdominal margin by two somewhat violaceous spots divided by the lower median nervule, a submarginal series of subviolaceous linear spots divided by the nervules and two similarly coloured spots near anal angle, the lowermost smallest; the fringe more broadly alternately greyish than above, the same colour extending to the basal margins of the caudate appendages. Body above blackish, the pronotal collar spotted with greyish; body beneath and legs blackish; the inner margin of eyes, posterior margin of head, spots to thorax and abdomen, and under surface of femora greyish.

Female. Anterior wings above with the subapical fascia larger and darker than in male, and with two obscure and dull ochraceous spots near outer angle divided by the submedian nervure; posterior wings above with the discal patch continued to abdominal margin by two dull ochraceous spots divided by the lower median nervule. Wings beneath as in male, but posterior wings with the submarginal apical spot much enlarged and continued inwardly, the submarginal spots larger than in male.

Exp. wings, ♂, 97 to 120 millim.; ♀, 80 to 132 millim.

HAB.—Continental India; Assam (Brit. Mus.).—Malay Peninsula; Province Wellesley (colls. Saüer and Dist.); Perak (Künstler—Calc. Mus.); Malacca (coll. Wall.; Pinwill—Brit. Mus.).—Sumatra (coll. Wall.; Forbes—coll. Dist.).—Borneo (Lowe—coll. Godm. & Salv.); Banjermasin (coll. Dist.); Elodina (Pryer—coll. Dist.).

In some specimens, especially in a Sumatran one now before me, the pale stramineous markings above are more or less shaded with dark ochraceous; in other respects the species seems fairly constant in character.

#### PAMMON † Group.

h. *Pammon*-group, Wallace, Trans. Linn. Soc. vol. xxv. p. 51 (1865).

Sect. LX., Sub-sect. A, Felder, Spec. Lepid. Pap. pp. 30, 78, 79 (1864).

*Laertias*, Hübn. Verz. bek. Schmett. p. 84 (1816); Moore, Lep. Ceyl. vol. i. p. 150 (1881).

This abundant and interesting group of Papilios is found in Continental India, and from thence distributed eastward through the continent as far north as China; it is also found in the Indian islands and throughout the Malayan Archipelago.

The group is also remarkable for the varietal and diverse forms of the females of the same species, as is shown in the only one found in this fauna.

\* Guérin's plate, as already noticed (*antea*, p. 335, *note*) was lettered erroneously, the species being fixed by that author's description.

† *P. pammon* is here enumerated and described under the older name of *P. polytes*.



12. *Papilio polytes*. (Tab. XXIII., figs. 7 ♂; 8, 9, 10 ♀.)

*Papilio Polytes*, Linnæus, Syst. Nat. ed. x. p. 460, n. 7 (1758); ib. ed. xii. p. 746, n. 5 (1767); Clerck, Icones, t. 14, f. 1 (1759); Cram. Pap. Ex. iii. t. 265, A—C (1782); Esper, Ausl. Schmett. p. 19, t. 3, f. 1 (1784); ibid. p. 50, t. 12, f. 1 (1786); Fabr. Syst. Ent. p. 443, n. 2 (1775); Spec. Ins. ii. p. 2, n. 4 (1781); Mant. Ins. ii. p. 1, n. 5 (1787); Ent. Syst. iii. p. 2, n. 5 (1793); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 103, n. 208 (1857); Reak. Proc. Ent. Soc. Phil. iii. p. 468, n. 16 (1864); Moore, Proc. Zool. Soc. 1865, p. 487; ibid. p. 756; Butl. Lepid. Fabr. p. 253, n. 62 (1869); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 12 (1877); Druce, Proc. Zool. Soc. 1873, p. 357, n. 10; ibid. 1874, p. 108, n. 4; Snell. Tijd. Ent. xix. p. 155, n. 71 (1876); Lep. v. Midd. Sum. p. 25, n. 6 (1880); de Nic. J. A. S. Beng. vol. L. p. 53, n. 61 (1881); Aurivill. Kongl. sv. vet. Akad. Handl. Band 19, no. 5, pp. 11, 12, 14 (1882).

*Papilio Polites*, Godt. Enc. Méth. ix. p. 70, n. 126 (1819).

*Princeps Stichius*, Hübn. Samml. Ex. Schmett. (1806—1816).

*Meneloides Polytes*, Hübn. Verz. bek. Schmett. p. 85, n. 869 (1816).

*Meneloides Alphenor*, Hübn. (part), Verz. bek. Schmett. p. 85, n. 870 (1816).

*Papilio Pammon*, Linn. Syst. Nat. ed. x. p. 460, n. 8 (1758); ibid. ex. xii. p. 746, n. 8 (1767); Clerck, Icones, t. 14, f. 2 (1759); Fabr. Syst. Ent. p. 445, n. 13 (1775); Spec. Ins. ii. p. 4, n. 16 (1781); Mant. Ins. ii. p. 3, n. 16 (1787); Ent. Syst. iii. p. 7, n. 20 (1793); Cram. Pap. Ex. ii. t. 141, B (1779); Esp. Ausl. Schmett. p. 246, t. 40, B. f. 1 (1793); Godt. Enc. Méth. ix. p. 74, n. 139 (1819); Boisd. Spec. Gén. i. p. 271, n. 96 (1836); Gray, Cat. Lepid. Papil. p. 19, n. 82 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 104, n. 209 (1857); Reak. Proc. Ent. Soc. Phil. iii. p. 466, n. 15 (1864); Wall. Trans. Linn. Soc. vol. xxv. p. 51, n. 62, t. 2, f. 1, 3, 5, 6 (1865); Moore, Proc. Zool. Soc. 1865, p. 487; ibid. p. 756; ibid. 1878, p. 840; Voll. Tijd. Ent. iii. p. 79, n. 79 (1860); Snell. Tijd. Ent. xx. p. 3 (1877); Godm. & Salv. Proc. Zool. Soc. 1878, p. 641, n. 30; Oberth. Études d'Ent. Quatr. Livr. p. 47, n. 79 (1879); Gosse, Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 301, t. 29, f. 7—9 (1882).

*Princeps Pammon*, Hübn. Samml. Ex. Schmett. i. t. 109 (1806—16).

*Laertias Pammon*, Hübn. Verz. bek. Schmett. p. 84, n. 861 (1816); Moore, Proc. Zool. Soc. 1882, p. 259.

*Papilio Romulus*, Cram. Pap. Ex. i. t. 43, A (1776); Gray, Cat. Lep. Papil. p. 20, n. 83 (1852); Moore, Proc. Zool. Soc. 1865, p. 765.

*Laertias Romulus*, Moore, Lep. Ceyl. vol. i. p. 150, t. 59, f. 1, a, b, c. (1881).

Male. Wings above blackish or very dark fuscous; anterior wings with an outer marginal series of small creamy spots placed between the nervules; posterior wings with a transverse discal series of large creamy spots divided by the nervules, the fringe alternately creamy and blackish. Wings beneath as above, but the posterior wings having a submarginal series of lunulate ochraceous spots, two spots a little above anal angle, the uppermost largest, reddish, and preceded by some bluish scales, the fringe-like spots much larger than above. Body and legs more or less concolorous with wings.

Female. *Varietal form a.*—Closely resembling the male above, but with a red spot at a little above anal angle of posterior wings; wings beneath as in male, but the reddish spot above anal angle of posterior wings duplex, and preceded by a somewhat reddish spot thickly irrorated with bluish scales situate between the second and third median nervules.

This is the form depicted at Tab. XXXIII., figs. 8 and 9, the last figure illustrating a specimen with a more or less distinct series of reddish submarginal spots to the posterior wings above, whilst the spot above anal angle is distinctly larger and enclosing a blackish centre.

Female. *Varietal form b.*—Anterior wings above much paler, the basal area darker and with darker streaks in cell and between the nervules; posterior wings with five creamy discal spots, one in and near end of cell and four beyond apex of cell divided by the discoidal and first and second median nervules, the innermost spot being more or less ochraceous and situate in a larger reddish patch irrorated with

violaceous scales which extends to abdominal margin, and being divided by the lower median nervule; a submarginal series of reddish lunulate spots placed between the nervules, the two within the area of the caudate appendage duplex, and a large reddish spot near anal angle with a blackish centre, the fringe alternately creamy and blackish. Anterior wings beneath much paler than above; posterior wings as above, but with the submarginal spots larger and irrorated with bluish scales and the fringe-like spots also larger than above.

This is the form depicted at Tab. XXXIII., fig. 10.

Exp. wings, ♂ and ♀, 80 to 110 millim.

HAB.—Continental India; N.W. Himalaya (Lang and Hocking—Moore); Bengal (coll. Moore); Sikkim (de Nicéville).—Ceylon (Thwaites—coll. Dist.).—Tenasserim; Ahsown, Meetan, Taoo (Limborg—Moore).—Malay Peninsula; Quedah, Penang, Province Wellesley (coll. Dist.); Perak (Künst.—Calc. Mus.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (coll. Wall.).—Sumatra (Snellen).—Billiton (coll. Godm. & Salv.).—Java (Vollenh.); Batavia (Snellen); Bantam (coll. Dist.).—Borneo (Lowe—coll. Godm. & Salv.); Sandakan (Pryer—coll. Dist.); Banjermasin (coll. Dist.).—Timor (Vollenh.).—Philippines (Reak.).—Siam; Chentaboon, Nahconchaisee (Druce).—Cochin China (Oberthür).—China (Horsf. & Moore); Canton (Vollenh.); Chekiang and Kiangsu Provinces (Pryer\*).—Chusan (Horsf. & Moore).

Considerable variation exists in the length of the caudate appendages to the posterior wings, and as Mr. Wallace pointed out, “The continental specimens . . . have all considerably developed tails in both sexes; the insular specimens, on the other hand (which I treat as a separate species), have only a prominent tooth or very short tail in the males.”† Messrs. Godman and Salvin also described the same character in Billiton specimens, in which the “caudal appendage” “is but slightly developed, and in this respect they agree best with Javan examples.”‡ I cannot, however, separate the continental and insular specimens as distinct species, for my own collection contains examples from Banjermasin in which the males have these appendages well developed, whilst in other males from North Borneo they are almost obsolete. We can, however, accept Mr. Wallace’s axiom in a general sense, and certify that insular specimens do, as a rule, vary from continental ones more or less in this respect.

The most interesting fact in relation to this species is its polymorphism in the female sex. Mr. Wallace first published these facts in his excellent memoir on the Malayan *Papilionide*, and they have since been abundantly verified. The first form of the female more or less resembles the male, as has already been pointed out (Tab. XXXIII., figs. 8 and 9); the second and most common form is that depicted at Tab. XXXIII., fig. 10, whilst a third form—but one at present unknown to the writer as having been found in the Malay Peninsula—is the *P. romulus*, Cram. These facts do not rest on mere conjecture. We have the statement of the late Dr. Thwaites that in Ceylon he had “repeatedly reared the three forms of female from larvæ apparently quite indistinguishable from one another.”§ Mr. L. de Nicéville has also by experimental breeding placed the question beyond doubt, although, as he says, “My experiments have so far been only partially successful, as from one form of female I have been able to breed males and two forms of females, one like the mother, the other like one of the two female forms”; still, as his experiments were with females of forms II. and III., the

\* Ent. Month. Mag. vol. xiv. p. 52 (1877).

† Proc. Zool. Soc. 1878, p. 641.

‡ Trans. Linn. Soc. vol. xxv. p. 51.

§ Moore’s Lepid. Ceylon, vol. i. p. 151.

evidence is convincing, if not decisive.\* The *rationale* of this female polymorphism has been sought in the doctrine of "mimicry," the second form of the female more or less resembling *Papilio aristolochie*, which, as already pointed out (*antea*, p. 338), possesses an odour which is probably distasteful, and hence protective from that butterfly's enemies, by affording an immunity from attack. The female form III. (not at present known from the Peninsula) more or less resembles *Papilio hector*, Linn., which is also absent from our fauna, and therefore we can scarcely expect to find the imitator in the absence of the imitated. Mr. Meldola has offered a suggestion on the subject in the proposition "that the di- and trimorphism displayed by certain butterflies has originated through polymorphism from ordinary variability." It being only necessary "for the immediate female forms to become extinct" in order to have true cases of the phenomena.† That the variation is somewhat of a seasonal nature is indicated by the statement of the Rev. J. H. Hocking that in the N.W. Himalaya,—where the larva was found on lemon-tree "June 19,"—"The perfect insects (male and female of *pammon* form) fly from March to December, at an elevation of 6000 feet. The *polytes* form ♀, is more restricted to the hot valleys, not appearing before June, and very rarely found above 4000 feet."‡

The larva and pupa of this species (under the names of *P. polytes* and *P. pammon*) have been figured by Horsfield and Moore,§ and reproduced here (*antea*, p. 321), and the larva is stated to feed in Java "on a species of *Citrus* bearing the native name of *Juruk*." Mr. de Nicéville describes the "common lime" as "one of the common food-plants of this species."

*P. polytes* is an abundant species wherever it is localised. Mr. Collingwood, when in Borneo, found it "floated over every hedgerow,"|| and scarcely a collection arrives from the East that does not contain its familiar presence.

#### DEMOLION Group.

k. *Demolion*-group, Wallace, Trans. Linn. Soc. vol. xxv. p. 59 (1865).

Sect. LIX., Subsect. B., Felder, Spec. Lepid. Pap. pp. 30, 78 (1865).

This is a small group of *Papilios* inhabiting many of the islands of the Malayan Archipelago, and might be considered altogether insular but for the one species here enumerated, which is found on the continent.

#### 13. *Papilio demolion*. (Tab. XXVII. b. fig. 3 ♂.)

*Papilio Demolion*, Cramer, Pap. Ex. i. t. 89, A, B (1779); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 105, n. 210 (1857); Wall. Trans. Linn. Soc. vol. xxv. p. 59, n. 79 (1865); Druce, Proc. Zool. Soc. 1873, p. 357, n. 9; *ibid.* 1874, p. 108, n. 3; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 9 (1877); Kheil, Rhop. der Insel. Nias. p. 37, n. 139 (1884).

*Papilio Cresphontes*, Fabr. (nec Cram.), Spec. Ins. ii. p. 19, n. 77 (1871); Godt. Enc. Méth. ix. p. 61, n. 98 (1819); Luc. Lep. Ex. t. 15, f. 1 (1835); Boisd. Sp. Gén. i. p. 220, n. 38 (1836).

\* An interesting account of these experiments is contained in 'The Asian Sporting Newspaper,' vol. iv. p. 175 (1880).

† Weismann's 'Studies in the Theory of Descent,' Eng. Transl. p. 250, *note*.

‡ Proc. Zool. Soc. 1882, p. 259.

§ Cat. Lep. Mus. E. I. C. t. 3, figs. 3, a; 4, a. The larvae of the two forms are also, according to Horsfield, seasonal in their appearance, as that of the form *P. polytes* is stated to feed in Java from January to May, and that of the form *P. pammon* from November to April (Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 105).

|| 'Entomologist,' vol. iv. p. 15 (1868).

Male. Wings above blackish; anterior wings crossed by a pale greenish fascia, broadest at inner margin and narrowed, broken and macular above the median nervules, the spots placed between the nervules, the uppermost and smallest being subapical; posterior wings with a broad transverse pale greenish fascia on inner half, a submarginal series of pale greenish, somewhat lunulate spots, and a reddish spot with a black centre above anal angle. Wings beneath much paler than above; anterior wings with pale stramineous streaks in cell, and the macular fascia as above; posterior wings much paler than above, the dark area before and beyond the transverse fascia being thickly dusted with pale greenish scales, beyond the fascia are a duplex series of black spots (some fused) separated by small patches of bluish scales, an ochraceous patch at apex and anal angle, the last containing a black spot, the submarginal series of pale greenish spots above, enlarged, fused and fascia-like beneath. Body above blackish; body beneath and legs more or less concolorous with wings; the legs much darker above.

Female. Larger than the male, colour somewhat paler, and the submarginal spots to the upper surface of the posterior wings ochraceous towards anal angle.

Exp. wings, ♂, 95 to 100 millim.; ♀, 98 to 105 millim.

HAB.—Burma; Moulmein (Brit. Mus.).—Malay Peninsula; Penang, Province Wellesley (coll. Dist.); Perak (Künst.—Calc. Mus.); Malacca (Pinwill—Brit. Mus.); Singapore (Wallace).—Sumatra (Wallace).—Nias Island (Kheil).—Java (Horsf. & Moore).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).—Siam; Chentaboon (Druce).

#### ERITHONIUS Group.

1. *Erithonius*-group, Wallace, Trans. Linn. Soc. vol. xxv. pp. 23, 59 (1865).

Sect. XXXIX., Subsect. B., Felder, Spec. Lep. Pap. pp. 21, 68 (1864).

*Orpheides*, Hübn. Verz. bek. Schmett. p. 86 (1816); Moore, Lep. Ceyl. vol. i. p. 146 (1881).

The characters of this and the three following groups are thus given by Mr. Wallace:—

“Larvæ subcylindrical, variously coloured. Imago with abdominal margin in ♂ plaited, but not reflexed; body weak; antennæ short, with a thick curved club; wings entire.”

This is an exceedingly small group, containing three species as enumerated by the Felders, two of which are, however, synthetically treated as one by Mr. Wallace. The sexes are similar, and the area of geographical distribution embraces Tropical and Subtropical Africa, and extends from Continental India to Australia.

#### 14. *Papilio erithonius*, var. *malayanus*. (Tab. XXVII. b, fig. 6.)

*Papilio Erithonius*, Cramer, Pap. Ex. iii. t. 232, A, B (1782); Gray, Cat. Lep. Papil. p. 21, n. 92 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 105, n. 211 (1857); Reak. Proc. Ent. Soc. Phil. iii. p. 472, n. 19 (1864); Moore, Proc. Zool. Soc. 1865, p. 487, n. 6; *ibid.* p. 757; Wall. Trans. Linn. Soc. vol. xxv. p. 59, n. 81 (1865); Druce, Proc. Zool. Soc. 1874, p. 108, n. 2; Butl. Proc. Zool. Soc. 1877, p. 814, n. 35; Oberth. Études d'Ent. Quatr. Livr. p. 57, n. 129 (1879); Elwes, Proc. Zool. Soc. 1881, p. 873; Gosse, Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 314, t. 31, f. 9—12 (1882).

*Papilio Epius*, Fabr. Ent. Syst. iii. 1, p. 35, n. 102 (1793); Don. Ins. China, t. 29, f. 2 (1799); Godt. Enc. Méth. ix. p. 43, n. 53 (1819); Boisd. Sp. Gén. i. p. 238, n. 61 (1836).

*Papilio Demolcus*, Esp. Ausl. Schmett. t. 50, f. 1—4 (1785—1798); Don. Ins. China, t. 29, f. 1 (1799).

*Papilio Erithonius*, var. *Malayanus*, Wall. Trans. Linn. Soc. vol. xxv. p. 59, n. 81 (1865).

*Papilio Malayanus*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 8 (1877).

*Orpheides Erithonius*, Moore, Lep. Ceyl. vol. i. p. 147, t. 61, f. 2, a, b (1881); Proc. Zool. Soc. 1882, p. 258.

Male. Wings above blackish; anterior wings with the cell and basal area marked with pale yellowish strigæ and a basal subcostal streak, and with the following spots of the same colour:—two in and before end of cell, two at extremity of cell, four subapical, an oblique series of five beneath cell and an outer submarginal series of smaller spots, fringe alternately yellowish; posterior wings with the basal area minutely speckled with yellowish, a broad and irregular macular pale yellowish transverse fascia divided by the nervules, generally followed by a small spot between the bases of the first and second median nervules, and containing a large black spot ocellated with bluish at the costal margin, an irregular submarginal series of pale yellowish spots and the area between these and the transverse fascia minutely speckled with yellowish, a dark red spot at anal angle posteriorly united to a small yellow spot and the fringe alternately spotted with pale yellowish. Anterior wings beneath spotted as above, but with basal pale ochraceous streaks both in and beneath cell, and with some ochraceous spots between the four subapical and the submarginal yellowish spots; posterior wings with the base ochraceous, outwardly margined with and inwardly containing a forked narrow black fascia, the central transverse fascia as above followed by ochraceous containing a blackish spot outwardly margined with bluish in and near end of cell, a transverse series of six similarly coloured spots beyond cell; five blackish spots at outer margin of the ochraceous area and a marginal blackish scalloped fascia; other spots and markings as above. Body above more or less concolorous with wings; body beneath pale yellowish, striped with blackish; legs yellowish, streaked with blackish.

Exp. wings, ♂, 80 to 82 millim.

HAB.—Continental India; N.W. Himalaya (Lang & Hocking—Moore); Bengal (Moore); Canara, Calcutta (Horsf. & Moore).—Ceylon (Moore).—Malay Peninsula; Quedah, Province Wellesley (coll. Dist.); Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (coll. Dist.).—Philippines (Reakirt).—Siam; Nahconchaisee (Druce).—Cochin China (Oberthür).—Formosa (Brit. Mus.).—China; Foochow (Elwes).

Mr. Wallace described his local form *malayanus* as wanting “the two spots on the lower margin of the cell of the hind wings,” but these are really present—though in a modified form—in all the specimens now before me from the Peninsula, excepting in one example from Singapore. The width of the transverse fascia in the cell is also somewhat wider than in the typical forms of *P. erithonius*, but the differences seem simply of a local and varietal character. In Western Australia a distinct form of this species is found, in the *P. sthenelus*, M'Leay.

As pointed out by Reakirt,\* several descriptions of the larva of this species had been published, which differed in several particulars. Since then the drawings of its transformations made by the Bros. de Alwis in Ceylon have appeared, and may be taken as decisive.† In Continental India the larva has been recorded by Capt. Hutton as feeding on the Citron;‡ in the Bengal Presidency its food-plants have been described, by Capt. Mortimer Slater, as the “Lime, Orange, and ‘Bel’ tree”;§ Mr. Hamilton's statement is that “the larva of this butterfly feeds on the Lime and Citron”;|| in N.W. India Capt. Lang found this species constant to the “Aurantiaceæ”;¶ at Mhow Mr. Forsayeth not only found the larva “on a species of orange or sweet lime tree, a large shrub with green fleshy leaves and thorny branches, common in Indian fruit gardens,” but subsequently “on a small green herb,

\* Proc. Ent. Soc. Phil. vol. iii. p. 475.

† Moore's Lep. Ceyl. p. 14, t. 61, f. 2a, b.

‡ Proc. Ent. Soc. vol. v. p. 48.

§ Horsf. & Moore, Cat. Lep. Mus. E. I. C., Append. p. 111.

|| Ibid.

¶ Ent. Month. Mag. vol. i. p. 104.

growing in grassy patches amongst cultivated fields."\* Mr. Forsayeth also adds the following interesting particulars:—"The larvæ appear invariably to attach themselves to the leaf on which they are feeding by a fine, almost invisible, web. On removing a larva from the leaf the web is dragged away by the feet, and then is easily seen. I have also noticed that they devour their exuviae, at least I never could find a cast skin in the cages in which I bred the larvæ from early youth to maturity."†

Dr. E. Bonavia found, whilst breeding this species at Etawah, in India, that the larvæ were attacked by parasitic flies belonging to the *Tachinidae*, whose eggs thus deposited in the caterpillar resulted in one chrysalis having succumbed in the struggle for existence with six larvæ as internal parasites."‡

#### PARADOXA § Group.

m. *Paradoxa*-group, Wallace, Trans. Linn. Soc. vol. xxv. p. 60 (1865).

Sec. XXXVII. (part), Felder, Spec. Lep. Pap. pp. 20, 66 (1864).

This is a remarkable group, the distribution of which is focussed in the Indo-Malayan region. These *Papilio*s "mimic" other protected butterflies, principally species of the genus *Euphva*.

Two species—according to present knowledge—are found in the Malay Peninsula; a third, *P. anigma*, has been recorded by Mr. Wallace|| as common to Malacca, Sumatra, and Borneo, but the first locality is probably incorrect, as the Malay Peninsula possesses a closely allied form or species in the *P. butleri*, Jans., here enumerated, and we have seen in other families that these local forms or species are generally quite constant and peculiar to their restricted habitats.

#### 15. *Papilio butleri*. (Tab. XXVII. a, fig. 6 ♂; Tab. XXVII., fig. 6 ♀.)

*Papilio Butleri*, Janson, Cist. Ent. vol. ii. p. 433 (1879).

Male. Anterior wings above dark velvety indigo-blue, the base somewhat brownish, and with the following pale violaceous markings:—a spot in and near end of cell, a small subcostal streak beyond end of cell, and a series of seven large linear submarginal spots placed between the nervules, which become fainter and somewhat broken towards the outer angle; posterior wings above dark chocolate-brown, with a faint submarginal series of very small bluish spots with dark margins, one near apex largest and brightest. Wings beneath pale chocolate-brown; both wings with a submarginal series of small and very pale violaceous spots; anterior wings with two pale streaks beneath base of cell; fringe alternately greyish. Body above somewhat blackish; pronotum anteriorly spotted with greyish; body beneath blackish, spotted with greyish; legs blackish, streaked with greyish.

Female. Wings above brown; anterior wings spotted as in male, but the spots greyish-white; posterior wings with a submarginal series of lunulate greyish spots; wings beneath generally as above.

Exp. wings, ♂, 90 to 95 millim.; ♀, 95 to 103 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Selangor, Kwala Lumpor (Biggs—coll. Dist.); Malacca (Janson).

\* Trans. Ent. Soc. Lond. 1884, p. 386.

| Ibid.

‡ 'Nature,' vol. xxxi. p. 29.

§ *P. paradoxa*, Zink., is a Javan species.

|| Trans. Linn. Soc. vol. xxv. p. 60 (1865).

This appears to be a moderately scarce species, and is related to some very closely allied forms in the neighbouring islands. Were the butterflies of the whole Malayan region being described, it would be possible to pursue the more reasonable course of arranging these local though distinct forms under one specific grouping, but, as the Rhopalocera of the Malay Peninsula are here alone enumerated, that course cannot be followed.

16. *Papilio caunus*, var. *ægialus*. (Tab. XXVII. b, fig. 5 ♂.)

*Papilio Caunus*, Westwood, Cat. Orient. Ent. t. 9, f. 2, 2\* (1848).

*Papilio Caunus*, race *ægialus*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 352 (1883).

Male. Wings above dark indigo-blue. Anterior wings with the following greyish-white spots:—a large spot crossing cell just before its extremity, preceded by a subcostal streak and followed beneath by two spots separated by the upper median nervule and a submarginal row of small spots which are more or less tinged with bluish; a small bluish discal spot between the second and third median nervules. Posterior wings with the cell, and adjoining streaks between the nervules,—practically absent between the upper discoidal and first median nervules, and longest and largest between the lower median nervule and submedian nervure,—greyish white; these streaks are outwardly notched and margined with pale bluish: a submarginal series of small lunulate whitish spots. Wings beneath dark brownish, with the greyish-white markings as above, the submarginal spots tinged with bluish. Body dark indigo-blue, spotted—especially beneath—with greyish; legs dark indigo-blue.

Exp. wings, ♂, 90 to 94 millim.

HAB.—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Singapore (coll. Godfery).

The interest attaching to this local race of *E. caunus* is principally owing to its being a "mimic" of *Euplœa dioeletianus*, which is also the local race or form in the Malay Peninsula of *E. rhadamanthus*.\* We thus see this mimicking *Papilio* modified in the same manner as its mimicked *Euplœa*, and if *E. dioeletianus* is to be recognised as a distinct species, this local form, variety, or race, will have (in an artificial and systematic sense only) to be recorded in the same way. I have been recently informed by Mr. O. Salvin that he has received Bornean examples of the *Papilio* which mimic the Bornean form of the *Euplœa*, viz. *E. lowei*.

DISSIMILIS Group.

n. *Dissimilis*-group, Wallace, Trans. Linn. Soc. vol. xxv. pp. 23, 61 (1865).

Sect. XXXVII. (part), Felder, Spec. Lep. Pap. pp. 20, 66 (1865).

*Arisbe*, Hübn. (part), Verz. bek. Schmett. p. 89 (1816).

*Clytia*, Swains. Zool. Illust. ser. 2, iii. t. 120 (1833).

*Chilasa*, Moore, Lep. Ceyl. vol. i. p. 153 (1881).

This is a small group of species found in and between Continental India and the Malayan Archipelago.

17. *Papilio clytia*. (Tab. XXVII. b, fig. 2 ♂.)

*Papilio Clytia*, Linnæus, Syst. Nat. ed. x. p. 479. n. 125 (1758); Mus. Ulr. p. 296 (1764); Syst. Nat. ed. xii.

p. 781, n. 189 (1767); Fabr. Syst. Ent. p. 507, n. 270 (1775); Spec. Ins. ii. p. 95, n. 415 (1781);

Mant. Ins. ii. p. 50, n. 500 (1787); Ent. Syst. iii. 1, p. 127, n. 387 (1793); Gmel. Syst. Nat. i. 5,

p. 2324, n. 189 (1790); Butl. Cat. Fabr. Lep. p. 244, n. 39 (1869); Trans. Linn. Soc. ser. 2, Zool.

vol. i. p. 552, n. 11 (1877); Aurivill. Kongl. sv. vet. Akad. Handl. Band. 19, p. 96, n. 114 (1882).

\* *Antea*, p. 28.

*Papilio Dissimilis*, Linn. Syst. Nat. ed. x. p. 479, n. 130 (1758); Mus. Ulr. p. 301, n. 119 (1764); Syst. Nat. ed. xii. p. 782, n. 195 (1767); Clerck, Icones. Ins. i. t. 16, f. 2 (1759); Fabr. Syst. Ent. p. 511, n. 288 (1775); Spec. Ins. ii. p. 101, n. 444 (1781); Mant. Ins. ii. p. 54, n. 539; Ent. Syst. iii. 1, p. 38, n. 113 (1793); Cram. Pap. Exot. i. t. 82, C, D (1775); Sulz. Gesch. Ins. p. 145, t. 18, f. 6 (1776); Gmel. Syst. Nat. i. 5, p. 2325, n. 195 (1790); Herbst, Naturs. Schmett. vi. p. 41, n. 23, t. 126, f. 2, 3 (1793); Esper, Ausl. Schmett. p. 233, t. 57, f. 3 (1798); Godt. Enc. Méth. ix. p. 75, n. 143 (1819); Lucas, Lep. Exot. p. 46, t. 23, f. 2 (1835); Boisd. Sp. Gén. i. p. 377, n. 224 (1836); Gray, Cat. Lep. Papil. p. 71, n. 330 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 91, n. 187 (1857); Voll. Tijd. Ent. iii. p. 88, n. 155 (1860); Reak. Proc. Ent. Soc. Phil. iii. p. 490, n. 28 (1864); Moore, Proc. Zool. Soc. 1865, p. 486; *ibid.* p. 756; Oberth. Etudes d'Ent. Quatr. Livr. p. 100, n. 323 (1879).

*Clytia Dissimilis*, Swains. Zool. Ill. Ins. ii. t. 120 (1833).

*Chilasa Dissimilis*, Moore, Lep. Ceyl. vol. i. p. 153, t. 57, f. 1, *a, b* (1881); Proc. Zool. Soc. 1882, p. 261.

Male. Wings above blackish, with pale ochraceous markings; on anterior wings these markings consist of a narrow basal subcostal streak, a triangular patch outwardly and triple-cleft occupying about basal half of cell, three spots in and before end of cell, followed by a curved discal series of ten spots irregular in shape and size, two long and basally fused fasciate-like spots between lower median nervule and submedian nervure, a submarginal row of smaller spots, a prominent apical spot, and a series of minute fringe-like spots; on posterior wings the markings are as follows:—a large patch more or less occupying cell, which is surrounded by a series of long and fasciate-like spots placed between the nervules; these spots are outwardly lunate and somewhat lanceolate inwardly,—that between the lower median nervule and the submedian nervure being much the longest,—and a submarginal series of lunate spots; two dark ochraceous spots at anal angle and the fringe alternately of that colour. Wings beneath much paler than above; anterior wings spotted as above, but the spots paler than above and somewhat shaded with bluish; posterior wings creamy, the neuration broadly blackish, a submarginal series of creamy spots with blackish margins, a marginal series of dark ochraceous spots with inner blackish margins and a large and similar spot, with a blackish centre at anal angle; fringe alternately creamy-white. Body above and beneath blackish, spotted and striped with pale ochraceous; legs blackish, streaked with pale ochraceous.

Exp. wings, 92 to 110 millim.

HAB.—Continental India; N.W. Himalaya (Lang & Hocking—Moore); Canara (Horsf. & Moore); Darjeeling (coll. Dist.)—Ceylon (Thwaites—coll. Dist.)—Malay Peninsula; Penang; Province Wellesley (coll. Dist.); Perak (Biggs—coll. Dist.)—Philippines (Reak.)—Cochin China (Oberth.)—China (Voll.); Hong Kong (Gray).

The larva and pupa of this species have been figured by Horsfield and Moore,\* and were copied from the drawings of General Hardwicke, in the Library of the British Museum. They have also been figured in Moore's 'Lepidoptera of Ceylon,'† from drawings made on that island by the Bros. de Alwis, and the larva is there stated to feed on "*Tetranthera*," and again by Mr. Mackwood to feed on Cinnamon.‡ Horsfield and Moore also state that the transformations were observed by Lady Gilbert,—presumably in Continental India,—who described the larva as feeding on a plant called by the natives *Maike*. "The larva was obtained on the 26th July; two days after it commenced its transformation, and on the following day the chrysalis resembled a dried twig, adhering to the frame only by the extremity of the tail, and supported on each side by two fine threads; in this state it died."§ In N.W. India, Capt. Lang writes:—"The only place in which I have seen this species is Subbathoo, altitude 4000 feet, in June, frequenting a grassy undulating down, flying rapidly

\* Cat. Lep. Mus. E. I. C., T. 11, f. 3, 3*a*, 3*b*.

† Lep. Ceylon, vol. i. t. 57, f. 1*a*, 1*b*.

‡ *Ibid.* p. 153.

§ Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 92.



in long circuits, pitching occasionally on grassy knolls, and generally returning by the same route to the same spot after a flight."\* In the same district the Rev. J. H. Hocking describes the flight of this butterfly as "very strong."†

### 18. *Papilio onpape*. (Tab. XXVII., fig. 5.)

*Papilio onpape*, Moore, Proc. Zool. Soc. 1878, p. 840.

Wings above dark brownish, with the following pale creamy ochraceous spots:—anterior wings with four subapical spots divided by the nervules—of which the uppermost is much the largest—followed by a submarginal series of smaller spots divided by the nervules—duplex between lower median nervule and submedian nervure—and a marginal series of small subquadrate spots; posterior wings with a double sumarginal series of spots, the innermost faintest, lanceolate, and not extending above the lower subcostal nervule, the outermost brighter and lunulate, excepting the two subapical spots which are rounded, the innermost above anal angle being dark ochraceous; fringe alternately pale ochraceous and a dark ochraceous spot at anal angle. Wings beneath as above, but the anterior wings having the spots somewhat paler and the large subapical spot more or less broken; posterior wings as above, but with a marginal series of large ochraceous spots placed between the nervules. Head and thorax above blackish; head and pronotum spotted with greyish; abdomen above brownish; body beneath more or less dark brownish, spotted and marked with greyish; (legs in specimen here described mutilated).

Exp. wings, 100 millim.

HAB.—Tenasserim; Hatsiega, Houngduran Source, Naththoung (Limborg—Moore).—Malay Peninsula; Province Wellesley (coll. Dist.).

This is a local race or form of *P. panope*, Linn., found in Continental India, and is not at all a common insect in collections received from the Malay Peninsula.

### MACAREUS † Group.

o. *Macareus*-group, Wallace, Trans. Linn. Soc. vol. xxv. pp. 23, 61 (1865).

Sect. XXXVI., Felder, Spec. Lep. Pap. pp. 20, 66 (1864).

The butterflies of this group "mimic" different species of the "protected" subfamily *Danaine*, and are found from Continental India throughout the Malayan Archipelago. This and the two following groups have been thus diagnosed by Mr. Wallace:—

"Larvæ elongate, attenuate behind, and often bifid, with lateral and oblique pale stripes, green. Imago with the abdominal margin in ♂ reflexed, woolly or hairy within; anal valves small, hairy; antennæ short, stout; body stout."

\* Proc. Zool. Soc. 1865, p. 486.

† Ibid. 1882, p. 261.

The difficulty of capturing the strong and swift-flying *Papilios* is not inconsiderable, and Mr. Collingwood in Labuan found that "the sacrifice of a single specimen will often secure others; for butterflies are gregarious, and a dead specimen pinned upon a conspicuous twig will often arrest an insect of the same species in its headlong flight, and bring it down within easy reach of the net, especially if it be of the opposite sex" ('Rambles of a Naturalist,' p. 182). Insects can also be deceived by painted representations of flowers and fruits. Our celebrated painter, Mr. Millais, has related the following curious facts:—"I was painting in spring a picture which I called 'Apple Blossoms.' I painted the trees when they were in full flower, and, not being able to finish the work in one spring, I continued the picture the following spring, so that many of the flowers were quite dry. I should tell you that I had my canvas out in the orchard, and worked direct from Nature. I was perfectly annoyed by bees crawling over my canvas, and *distinctly* going to the centre of my painted blossoms—those a year old and scentless—as well as the wet ones, which might have had attractions in the way of smell, from oil and turpentine. To my mind they *mistook the imitation for the real flower*. They were a great nuisance, and retarded my work, dragging their legs, clogged with white and pink paint across the canvas. Some of the blossoms I painted in the foreground were nearly the real size, and to those they chiefly went" (W. L. Lindsay's 'Mind in the Lower Animals,' vol. i. p. 517).

‡ *P. macareus*, Godt., is a species found in Continental India, and recorded also from Java and Borneo.

Two species are here enumerated, but two others, *P. macarcus*, Godt., and *P. dehaanii*, Wall., are likewise recorded by Mr. Wallace as found at Malacca;\* these are not here included, as up to the present time the writer has neither received nor seen specimens from the Peninsula.

19. *Papilio delessertii*. (Tab. XXVII. *b*, fig. 4, ♂.)

*Papilio Delessertii*, Guérin, Deless. Souv. Inde. ii. p. 68, t. 17 (1843); Gray, Cat. Lep. Papil. p. 71, n. 325 (1852); Wall. Trans. Linn. Soc. vol. xxv. p. 62, n. 93 (1865); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 10 (1877).

Male and Female. Wings above pale lavender in hue; anterior wings with the whole costal area and apex black, containing a series of small whitish spots above cell; cell black, with two small basal spots and four transverse fasciæ pale lavender,—of these fasciæ the two innermost are oblique, the two outermost irregularly bent, and the one at apex of cell frequently broken,—neuration broadly blackened, and thus widened triangularly at outer margin; a submarginal series of black spots divided by the nervules and a black patch resting on bases of the discoidal and upper median nervules—in many specimens the ground colour is broken up and appears at end of cell as a series of about five pale spots. Posterior wings with the neuration—broadly—a submarginal series of spots, and a broad outer margin black: the two submarginal spots near anal angle more or less margined with bright ochraceous. Wings beneath as above, but paler, the black markings smaller, broken, and there replaced by pale purplish black; posterior wings with a large bright ochraceous patch above anal angle, and the outer margin broken and macular. Body more or less concolorous with wings; legs streaked with blackish.

Exp. wings, ♂ and ♀, 83 to 95 millim.

HAB.—Malay Peninsula: Province Wellesley (colls. Sauer and Dist.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (Gray).—Borneo (Lowe—coll. Dist.); Elodina (Pryer—coll. Dist.).

This is not an abundant species in the Peninsula, and though most collections made there contain it, it is always in very limited number.

20. *Papilio leucothoe*. (Tab. XXVII. *a*, figs. 2 ♂, 3 ♀.)

*Papilio Leucothoe*, Westwood, Arc. Ent. ii. t. 79, f. 3 (1845); Oberth. Études d'Ent. Quatr. Livr. p. 100, n. 317, and p. 117, n. 317 (1879).

Male. Anterior wings above dark fuscous, with the following greyish-white markings:—two small basal spots, five small spots in and towards end of cell,—the outer four arranged in pairs,—three small spots beyond end of cell, followed by four larger spots separated by the nervules, three long fasciate-like streaks beneath cell divided by the second and third median nervules,—the innermost longest and duplex,—a streak on inner margin, and a submarginal series of small spots; posterior wings greyish-white, with the neuration, a basal patch emitting a streak which enters and nearly crosses cell, and a marginal and submarginal fascia—enclosing a series of pale lunulate spots—dark fuscous. Wings beneath with the markings similar, but the dark coloration very much paler than above. Body above very dark fuscous, the inner margin of eyes and spots on pronotum greyish-white; body beneath dark fuscous, the thorax spotted, and the abdomen striped with greyish-white.

Female. Darker and brighter than the male, and differing from that sex in the following particulars:—the anterior wings do not possess the pale cellular spots, and the three fasciate-like streaks

\* Trans. Linn. Soc. vol. xxv. p. 62 (1865).

beneath cell are very much abbreviated and lanceolate in shape; in the posterior wings the streak which nearly crosses cell in male, completely crosses it and is continued beneath to the lower median nervule. Wings beneath as above, but paler.

Exp. wings, ♂, 88 millim.; ♀, 98 millim.

HAB.—Malay Peninsula; Selangor: Kwala Lumpor (Biggs—coll. Dist.); Malacca (coll. Oberth.).—Sumatra (coll. Oberth.).

The resemblance of this species—especially in the male—to a *Danaid* is one of those facts which support the true theory of “mimicry,” and the protection thus acquired by so closely simulating a *protected* or *distasteful Danaid* is self-evident.\*

### ANTIPHATES Group.

p. *Antiphates*-group, Wallace, Trans. Linn. Soc. vol. xxv. p. 63 (1865).

Sect. XXI., Sub-sect. C. Felder, Spec. Lepid. Pap. pp. 14, 58 (1864).

*Pathysa*, Reak. Proc. Ent. Soc. Phil. iii. pp. 503-4 (1864); Moore, Lep. Ceyl. vol. i. p. 141 (1881).

In this group the posterior wings possess the maximum of caudate prolongation, and really merit the popular name of “swallow-tails.” Their area of distribution comprises Continental India, the adjacent islands, the Malay Peninsula, the Malayan Archipelago, portions of Australia, and extends as far north as China.

One species is at present only known in this fauna.

#### 21. *Papilio antiphates*, var. *pompilius*. (Tab. XXXI., fig. 5 ♂.)

*Papilio Antiphates*, Cramer, Pap. Ex. i. t. 72, A, B (1779); Boisd. Spec. Gén. i. p. 248, n. 72 (1836); Gray, Cat. Lep. Papil. p. 31, n. 147 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 116, n. 232 (1857); Voll. Tijds. Ent. iii. p. 77, n. 57 (1860); Wall. Trans. Linn. Soc. vol. xxv. p. 63, n. 99 (1865); Moore, Proc. Zool. Soc. 1865, p. 757; *ibid.* 1877, p. 593; *ibid.* 1878, p. 841; Druce, Proc. Zool. Soc. 1878, p. 357, n. 20; Snell. Tijds. Ent. xix. p. 155, n. 68 (1876); Lep. v. Midd. Sum. p. 25, n. 2 (1880); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 1 (1877); Godm. & Salv. Proc. Zool. Soc. 1878, p. 641, n. 27; Oberth. Études d'Ent. Quatr. Livr. p. 63, n. 156 (1879).

*Papilio Alcibiades*, Fabr. Mant. Ins. ii. p. 8, n. 65 (1787).

*Papilio Antiphates*, var. *Alcibiades*, Butl. Cat. Fabr. Lep. p. 240 (1869).

\* It may be not altogether supererogatory to give a few facts relative to the insect depredations of birds, and hence the need of some form of protection on the part of edible insects. This can be evidenced by observations made in this country alone, and we will take the Rev. F. O. Morris as witness. He states “that not only such birds as sea gulls, but that all the owls, even up to the eagle owl, feed on insects when they come in their way, and not only the owls, but all the six British species of true falcons,— . . . —as also most, if not all, of the hawks, and some, if not all, even of the eagles, the spotted eagle for instance? Few persons are aware of the innumerable number of insects thus destroyed by birds. The following observations, and several of them are much below the mark, will show this:—

“The blue titmouse has been watched, and found to feed its young from 3.30 a.m. to 8.30 p.m. 475 times, bringing one large or two or three small insects each time.

“The thrush, from 1.15 a.m. to 9.15 p.m., 206 times.

“The blackbird, from 3.15 a.m. to 8.40 p.m., 113 times.

“The miseltoe thrush, from 4.20 a.m., to 8 p.m., 66 times, each time bringing several large worms or insects.

“The sparrow, from two or three to six or eight insects at once, and as this goes on for all the day, and they frequently have two or three broods in the year, they must destroy an immense number.

“I watched the other day a wagtail catching insects to feed its young, and it took eight or nine into its bill in a minute or two, and had not left off when I turned away.”—*Letters to “The Times” about Birds, &c.*, p. 40.

The quantity of insects in the tropics is something enormous, and requires “checks.” In Mexico, Mr. E. B. Tylor has related that in order to supply an armadillo with food an old Indian “walked out into the fields with an earthen pot, and returned with it full of insects in about half-an-hour. We reckoned that there were over fifty species in the pot” (*Anahuac*, p. 319).

*Papilio Pompilius*, Fabr. Mant. Ins. ii. p. 8, n. 66 (1787); Godt. Enc. Méth. ix. p. 49, n. 70 (1819).

*Podalirius Pompilius*, Swains. Zool. Ill. Ins. ii. t. 105 (1833).

*Pathysa Antiphates*, Moore, Lep. Ceyl. vol. i. p. 142, t. 63, f. 1, 1 a (1881).

*Papilio itamputi*, Forbes.\*

Male and Female. Wings above pale stramineous; anterior wings with the cell crossed by five black fasciæ, the first and second slender, the third broad, the fourth wedge-shaped and not reaching the median nervure, the fifth broadest and occupying extremity of cell, a broad marginal and a submarginal black fascia which amalgamate at about the second median nervule, and the marginal fascia not quite reaching the outer angle, the ground colour of the basal half of cell and of the apical area is pale greenish, the costal margin being narrowly black; posterior wings with a black lunate and broken marginal fascia, the caudate appendages black, outwardly and narrowly margined with ochraceous, with their apices greyish, a plumbaginous patch at anal-angular area containing two or three submarginal narrow transverse black spots, and extending a short distance down the caudate appendages, anal angle inwardly margined with ochraceous, with a black spot above. Anterior wings beneath marked as above, but with the two basal fasciæ extending a short distance beneath cell, the fourth fascia almost reaching the median nervure, the marginal and submarginal fasciæ not amalgamated at the second median nervule, and the ground colour at the area of the median nervules pale greyish-white; posterior wings beneath with the basal half greenish, crossed by three longitudinal narrow black fasciæ, the outermost irregular and sometimes more or less broken; this is followed by a series of irregular black spots; the ground colour is then dark ochraceous, with a submarginal series of black spots approaching closer to the margin towards anal angle, a broken lunately macular black margin which at anal angle is preceded by dark plumbaginous between it and the submarginal spots; a large black spot above anal angle preceded by two transverse yellowish spots, margined on each side by blackish; caudate appendages as above, but with a pale central line almost reaching their apices. Body above with the thorax pale plumbaginous; the abdomen ochraceous, with dorsal black spots; body beneath and legs very pale ochraceous, the abdomen and thorax margined with blackish, the legs streaked with blackish.

Exp. wings, ♂ and ♀, 72 to 84 millim.

HAB.—Continental India; Silhet (Horsf. & Moore); Sikkim (coll. Dist.).—Ceylon (Moore).—Andaman Islands; Port Blair (Moore).—Tenasserim; Houngduran Source (Linborg—Moore).—Malay Peninsula; Province Wellesley (colls. Dist. and Säuer); Perak (Künst.—Calc. Mus.); Malacca (Pinwill—Brit. Mus.).—Sumatra (Snellen).—Billiton (Godm. & Salv.).—Java (Horsf. & Moore); Batavia (Snellen).—Borneo (Lowe—coll. Dist.); Banjermasin, Pontianak (Voll.).—Philippines (Semper).—China; Hong Kong (Gray).

This species is very variable and extremely difficult to properly identify under its several named forms. Firstly, all the Malaccan forms are distinctly separable from the true *P. antiphates* in not having the first and second basal fasciæ of the anterior wings extending beneath the cell, and also in not having the outer marginal fascia quite reaching the outer angle. This form is found in Continental India (I have specimens from Sikkim) and in China. We have now three named forms differing in these respects from *P. antiphates*,—the *P. alcibiades*, Fabr., *P. pompilius*, Fabr., and *P. itamputi*, Forbes,—and for drawings made of these, and for precise and liberal information concerning the same, I am much indebted to Mr. A. G. Butler. I thus learn that *P. alcibiades* is the Javan form of the species, and that “the *P. pompilius* of Fabricius is I believe correctly identified by Swainson . . . . and is the Malaccan form of *P. alcibiades*, difficult to separate from it indeed by description . . . . but

\* I am informed by Mr. Butler that this form is described in Forbes' ‘Nat. Wand. East Archipel.’ but I have not yet seen that work.

nevertheless having a different aspect; it is somewhat larger, has all the markings blacker and thicker on both surfaces, the triangular band (*i. e.*, the fourth true band) broader, and more elongated so as almost to cross the cell," &c. Now this last character is very variable in Malaccan specimens, for in my own collection are examples in which this band completely crosses the cell; others in which it does not reach the median nervure, as in the specimen figured (Tab. XXXI., fig. 5), and which is the form *Pompilius*; whilst in others the band is much abbreviated and barely crosses a third of the cell, thus approaching and sometimes completely agreeing with the form *P. alcibiades*, and these three different aspects of the species are to be found in a single collection made in Perak at the same time. I have therefore thought it best to treat *P. antiphates* and all its varieties synthetically, and its habitats thus and here given must be understood to apply in this larger sense.

It should be added that the form discriminated by Mr. Forbes under the name *P. itamputi* is found in Sumatra.

The larva and pupa as found in Java have been figured by Horsfield and Moore,\* and the first is stated to feed "on a species of *Uvaria* bearing the native name of *Kalak*." †

#### EURYPYLUS † Group.

q. *Eurypylus*-group, Wallace, Trans. Linn. Soc. vol. xxv. p. 64 (1865).

Sect. XXVII., Felder, Spec. Lepid. Pap. pp. 16, 61 (1864).

*Zetides*, Hübn. Verz. bek. Schmett. p. 85 (1816); Moore, Lep. Ceyl. vol. i. p. 144 (1881).

*Chlorisses*, Swains. Zool. Ill. ii. 89 (1832).

*Dalchina*, Moore, Lep. Ceyl. vol. i. p. 143 (1881).

This is a somewhat numerous group of species whose distribution is focussed in the Malayan Archipelago, and its habitual area also comprises Continental India and adjacent islands, the Malay Peninsula, China, Japan, and some parts of Australia.

Mr. Wallace, who observed these beautiful butterflies in a state of nature, describes them as flying "with the greatest rapidity of any *Papilios*; the eye can scarcely follow them; in fact, they much resemble in habit the humming *Sphinxes*, and hover over flowers, or more frequently over damp places on the ground, with a constant vibration of the wings." §

Seven species are known to the writer as inhabiting the Malay Peninsula.

#### 22. *Papilio sarpedon*. (Tab. XXXII., fig. 6.)

*Papilio Sarpedon*, Linnæus, Mus. Uhr. p. 196 (1764); Syst. Nat. ed. xii. p. 747, n. 15 (1767); Fabr. Syst. Ent. p. 447, n. 21 (1775); Spec. Ins. ii. p. 8, n. 28 (1781); Mant. Ins. ii. p. 4, n. 30 (1787) (part); Ent. Syst. iii. p. 14, n. 41 (1793) (part); Esper, Ausl. Schmett. p. 38, t. 8, f. 2 (1785); Godt. Enc. Méth. ix. p. 46, n. 62 (1819); Luc. Lep. Exot. p. 9, t. 5, f. 1 (1835); Boisd. Spec. Gén. i. p. 235, n. 57 (1836); Gray, Cat. Lep. Papil. p. 28, n. 135 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 113, n. 226 (1857); Voll. Tijd. Ent. iii. p. 76, n. 48 (1860); Reak. Proc. Ent. Soc. Phil. iii. p. 483, n. 24 (1864); Wall. Trans. Linn. Soc. vol. xxv. p. 65, n. 110 (1865); Moore, Proc. Zool. Soc. 1865, p. 487, n. 8; *ibid.* p. 757; *ibid.* 1878, p. 841; Druce, Proc. Zool. Soc. 1873, p. 357, n. 21; Snell. Tijd. Ent. xix. p. 155, n. 69 (1876); *ibid.* xx. p. 3 (1877); Lep. v. Midd. Sum. p. 25, n. 4 (1880); Butl. Proc. Zool. Soc. 1877, p. 814, n. 34; Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 2 (1877); Godm. & Salv.

\* Cat. Lep. Mus. E. I. C. t. iii. fig. 10, 10 a.

† *Ibid.* p. 116.

‡ *P. eurypylus*, Linn., is a species found in the eastern islands of the Malayan Archipelago.

§ 'Zoologist,' p. 4636 (1855).

Proc. Zool. Soc. 1878, p. 641, n. 28; Oberth. Études d'Ent. Quatr. Livr. p. 59, n. 144 (1879); De Nic. J. A. S. Beng. vol. L. p. 59, n. 113 (1881); Aurivill. Kongl. sv. Vet. Akad. Handl. Band. 19, no 5, p. 20 (1882).

*Zetides Sarpedon*, Hübn. Samml. Exot. Schmett. iii. t. 25 (1824-11).

*Chlorisses Sarpedon*, Swains. Zool. Ill. ii. t. 89 (1832).

*Dalehina Sarpedon*, Moore, Proc. Zool. Soc. 1882, p. 257.

*Papilio Demophon*, Meerburgh, Afbeeld, t. 9 (1775); Shaw, Gen. Zool. vi. t. 64 (1806).

Male and Female. Wings above blackish; both wings crossed by a pale green discal fascia, which on the anterior wings is narrowed, broken, and macular above the median nervules and on the posterior wings is narrowed and elongately angulated beneath the median nervure; posterior wings with a submarginal series of lunulate green spots and three narrow pale greyish fringe-like spots at anal angle. Wings beneath paler than above; posterior wings having the base of the green fascia inwardly margined with a black and red spot, a black spot outwardly margined with red occupying apex of cell, between which and the submarginal green spots there are an irregular series of blackish spots which from cell to anal angle are more or less marked with carmine-red. Body and legs more or less concolorous with wings; legs more or less greyish.

Exp. wings, ♂ and ♀, 72 to 85 millim.

HAB. — Continental India; N.W. Himalaya (Lang and Hocking—Moore); Sikkim (De Nic.); Darjeeling (coll. Dist.). — Tenasserim; Hatsiega, Hougduan Source (Limborg—Moore). — Malay Peninsula; Quedah, Province Wellesley, Penang (coll. Dist.); Perak (Künst.); Malacca (Pinwill—Brit. Mus.). — Sumatra (Voll.). — Billiton (coll. Godm. & Salv.). — Java; Batavia (Snell.). — Borneo (Druce); Elodina (Pryer—coll. Dist.); Banjermasin (coll. Dist.). — Philippines (Semper). — Celebes (Voll.). — Amboina (Voll.). — Aru Islands (Wallace). — New Guinea (Wallace). — Formosa (Brit. Mus.). — China; Shanghai (Pryer—Elwes). — Japan (coll. Dist.).

This is an abundant species, and its habits have been variously described. Thus Mr. de Nicéville found it in Sikkim as particularly fond of imbibing moisture from damp spots on the ground, and as returning to the same place, however often disturbed,\* and the first part of this observation coincides with the writer's experience in Province Wellesley. In the N.W. Himalaya Capt. Lang described it as "seen but in few places, and never more than one at a time. It is bold and rapid in flight, and not easily captured."† In the same habitat, Mr. Hocking found it flying "round and round the tops of trees."‡ At Masuri, Capt. Hutton records it as "one of the commonest, but not the least beautiful, of our butterflies; it appears early in May, and is found till the end of the rains in September. It usually frequents the tops of oak trees, where it flies about with a jumping or jerking flight, and is somewhat difficult to capture from its quickness, and the height at which it keeps."§

### 23. *Papilio evemon*. (Tab. XXXII., fig. 1.)

*Papilio Eremon*, Boisduval, Spec. Gén. i. p. 234, n. 55 (1836); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 3 (1877); Oberth. Études d'Ent. Quatr. Livr. p. 59, n. 139 (1879); Kheil, Rhop. der Insel. Nias, p. 37, n. 142 (1884).

*Papilio Jason*, var. *Eremon*, Wall. Trans. Linn. Soc. vol. xxv. p. 67 (1865).

Male and Female. Wings above black, with the following pale greenish markings:—five spots in cell,—the basal three linear, the outermost two broader,—beyond cell is a discal series of eight spots

\* J. A. S. Beng. vol. L. p. 59 (1881).

† Proc. Zool. Soc. 1865, p. 487.

‡ Proc. Zool. Soc. 1882, p. 257.

§ Proc. Ent. Soc. Lond. v. p. 51 (1848).

completely crossing wing, of which the five uppermost are quite detached and the third minute, the sixth, seventh and eighth being largest and fused, a submarginal series of small spots and a small subapical spot; posterior wings with a central discal macular fascia, not reaching anal angle and becoming narrowed and elongated between the second and third median nervules, a submarginal series of small spots, a greyish marginal spot above anal angle, and the fringe alternately greyish-white. Wings beneath very dark brownish, with a bronzy tinge, the pale greenish markings above very much paler and silvery beneath, the spots larger than above, the basal spot in cell of anterior wings much larger and continued beneath median nervure, meeting a similar basal spot on posterior wings which does not enter the cell; base of both wings silvery, posterior wings having the central fascia from end of cell to abdominal margin bordered with black and red spots; this central fascia at costal area is tinged with yellowish. Body above blackish, beneath greyish; legs blackish, speckled and streaked with greyish.

Exp. wings, ♂ and ♀, 75 to 83 millim.

HAB.—Malay Peninsula; Penang; Province Wellesley (coll. Dist.); Perak (Künst.—Calc. Mus.); Malacca (Pinwill—Brit. Mus.).—Sumatra (Boisd.).—Nias Island (Kheil).—Java (coll. Oberth.).

This is one of the commonest *Papilio*s in the Malay Peninsula, and is found in every collection.

#### 24. *Papilio mecisteus*, n. sp.

*Papilio Axion*, Butl. (nec. Feld.), Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 4 (1877).

Wings above almost indistinguishable from *P. exemon*; beneath differing principally from that species in the posterior wings, which have the short costal fascia, which amalgamates with the longitudinal fascia, rather closer to it and red spotted, and the central pale macular fascia more notched at cellular area.

Exp. wings = exp. *P. exemon*.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Borneo; Sandakan (Pryer—coll. Dist.).



FIG. 108.—*Papilio mecisteus*.

The figure is taken from a Malaccan specimen in the British Museum, which has been recorded as *P. axion*. A reference to Hübner's figure,\* however, to which Felder refers as indicating his *P. axion*, will at once separate it, and the junction of the short red-spotted costal fascia to the longitudinal one parallel with the abdominal margin of the posterior wings will, even alone, distinguish it from that species; a difference which is emphasised in Felder's description.

#### 25. *Papilio telephus*.

*Papilio Telephus*, Felder, Reise Nov. Lep. i. p. 64, n. 49 (1865).

*Zetides Telephus*, Moore, Lep. Ceyl. vol. i. p. 144, t. 63, f. 3 (1881).

*Papilio Jason* var. *Evemonides*, Honr. Berl. Entom. Zeitschr. Bd. xxviii. p. 396, t. x. f. 2 (1884).

\* Under the name of *Zetides eurypylus*, Samml. Ex. Schmett. (1816—1841).

FIG. 109.—*Papilio teleplus*.

Male and Female. Closely allied to *P. evemon* above, but with the basal linear spot in the cell of the anterior wings continued beneath to near the inner margin. Wings beneath as in *P. evemon*, but the short dark costal fascia to posterior wings *red-spotted* as in *P. mecisteus*, but not passing beyond the subcostal nervure, and thus being *well separated* from the basal longitudinal fascia which runs parallel with the abdominal margin.

Exp. wings, ♂ & ♀, 75 to 80 millim.

HAB.—Ceylon (Moore).—Malay Peninsula; Penang (Biggs—coll. Dist.); Perak (Künst.—Calc. Mus.).—Borneo; Sandakan (Pryer—coll. Dist.).

## 25. *Papilio bathycles*. (Tab. XXXII., fig. 2 ♂.)

*Papilio Bathycles*, Zinken-Sommer, Nova Acta Ac. Nat. Cur. xv. p. 157, t. 14, f. 6, 7 (1831); Boisd. Sp. Gén. i. p. 232, n. 52 (1836)?; Luc. Lep. Ex. t. 5, f. 2 (1835); Gray, Cat. Lep. Papil. p. 28, n. 132 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 114, n. 228 (1857); Voll. Tijd. Ent. iii. p. 76, n. 46 (1860); Wall. Trans. Linn. Soc. vol. xxv. p. 66, n. 113 (1865); Druce, Proc. Zool. Soc. 1873, p. 357, n. 23; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 5 (1877); Oberth. Études d'Ent. Quatr. Livr. p. 58, n. 137 (1879); Gosse, Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 313, t. 31, f. 1—5 (1882).

*Papilio Bathycles* var. *Bathycloides*, Honr. Berl. Entom. Zeitschr. Bd. xxviii. p. 396, t. x. f. 3 (1884).

Male. Wings above black, with the following pale green markings:—anterior wings with five spots in cell,—the one at apex small and rounded, the others more or less linear,—a discal oblique row of eight spots commencing just beyond end of cell and terminating on inner margin,—of these the third spot is smallest, and the sixth, seventh and eighth much the largest, the last two being more or less fused together,—a small subapical spot and a submarginal row of still smaller spots; posterior wings with the basal half of costal area greyish, three large discal spots,—the largest in cell, the smallest above cell, and the other situate between the two lower median nervules,—a submarginal row of small spots and a large greyish patch on abdominal margin, fringe alternately greyish. Wings beneath paler than above, the spots silvery in hue; anterior wings spotted as above; posterior wings with the three discal spots continued to costa in a large silvery patch, yellowish at base, and traversed by two dark fuscous fasciæ,—one near base parallel with abdominal margin, the other concave at about centre of wing, between these fasciæ the median nervure is broadly blackish; beyond cell and extending to a little above anal angle are a series of red spots, the innermost of which is followed by a small greyish spot; the submarginal spots much larger than above, with two additional linear spots situate one on each side of the upper subcostal nervure. Body above with the head and pronotum blackish; the abdomen fuscous; body beneath greyish; legs greyish, streaked with blackish.

Exp. wings, ♂, 74 millim.

HAB.—Malay Peninsula; Penang (Gray); Perak (Künst.—Calc. Mus.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (Gray).—Java (colls. Voll. and Wall.).—Borneo (Druce).

## 27. *Papilio arycles*. (Tab. XXXII., fig. 5.)

*Papilio Arycles*, Boisduval, Sp. Gén. i. p. 231, n. 51 (1836); Gray, Cat. Lepid. Papil. p. 27, n. 131 (1852); Druce, Proc. Zool. Soc. 1873, p. 357, n. 25; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 6 (1877); Oberth. Études d'Ent. Quatr. Livr. p. 58, n. 134 (1879).

*Papilio Rama*, Feld. Wien. Ent. Mon. iv. p. 394, n. 1 (1860); Reise Nov. Lep. i. p. 71, n. 54, t. 12 d (1865); Wall. Trans. Linn. Soc. vol. xxv. p. 68, n. 119 (1865).



Male and Female. Wings above blackish, with the following pale greenish spots:—five spots in cell, the apical spot smallest, an oblique discal row of eight spots commencing just beyond end of cell and terminating on inner margin,—of these spots the third is minute, the sixth and seventh largest, and the eighth moderately attenuated,—two contiguous spots at base parallel with basal spot in cell, a small subapical spot and a submarginal row of small spots; posterior wings with two costal basal very pale spots, and the following spots as on anterior wings:—two elongated spots parallel with abdominal margin, the uppermost being situate in cell, a discal row of three much smaller spots, the second of which is situate in apical portion of cell, and a submarginal row of small spots, the fringe being alternately greyish. Wings beneath paler than above; anterior wings spotted as above, but the spots much paler; posterior wings spotted as above but paler, the two elongate spots parallel with abdominal margin preceded by two contiguous spots, between which and a large costal spot is a small spot of reddish-carmine, the small green spot between bases of first and second median nervules above red beneath, and followed by two other red spots, the last of which is situate on abdominal margin; the discal spots on the posterior wing have a yellowish tinge, and the basal portion of the abdominal margin is of the same hue marked posteriorly with a red streak. Body above blackish; body beneath and legs greyish-white, the last streaked with blackish.

Exp. wings, ♂ and ♀, 70 to 72 millim.

HAB.—Continental India; N.E. India (Gray).—Malay Peninsula; Penang, Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (coll. Oberth.).—Borneo (Druce).

## 28. *Papilio agamemnon*. (Tab. XXXII., fig. 7.)

*Papilio Agamemnon*, Linnæus, Mus. Ulr. p. 202 (1764); Syst. Nat. ed. xii. p. 748, n. 22 (1767); Fabr. Syst. Ent. p. 455, n. 51 (1775); Spec. Ins. p. 20, n. 81 (1781); Mant. Ins. ii. p. 10, n. 92 (1787); Ent. Syst. iii. 1, p. 33, n. 98 (1793); Esp. Ausl. Schmett. t. 46, f. 1—3 (1796); Donovan. Ins. China, t. 27, f. 2 (1798); Godt. Enc. Méth. ix. p. 46, n. 63 (1819); Boisd. Sp. Gén. p. 230, n. 49 (1836); Gray, Cat. Lep. Papil. p. 27, n. 130 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 114, n. 229 (1857); Voll. Tijd. Ent. iii. p. 76, n. 44 (1860); Reak. Proc. Ent. Soc. Phil. iii. p. 478, n. 22 (1864); Wall. Trans. Linn. Soc. vol. xxv. p. 67, n. 118 (1865); Moore, Proc. Zool. Soc. 1865, p. 757; ibid. 1877, p. 592; ibid. 1878, p. 841; Druce, Proc. Zool. Soc. 1873, p. 357, n. 24; ibid. 1874, p. 108, n. 1; Snell. Tijd. Ent. xix. p. 155, n. 70 (1876); ibid. xxi. p. 38 (1878); Lep. v. Midd. Sum. p. 25, n. 5 (1880); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 552, n. 7 (1877); Oberth. Études d'Ent. Quatr. Livr. p. 58, n. 135 (1879); Wood-Mas. and de Nic. J. A. S. Beng. vol. xlix. p. 238, n. 69 (1880); Gosse, Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 314, t. 31, f. 6—8 (1882); Aurivill. Kongl. sv. vet. Akad. Handl. Band 19, n. 5, p. 24 (1882); Kheil, Rhop. der Insel Nias. p. 37, n. 143 (1884).

*Iphiclides Agamemnon*, Hübn. Verz. bek. Schmett. p. 82, n. 841 (1816).

*Zetides Agamemnon*, Moore, Lep. Ceyl. vol. i. p. 145, t. 63, f. 2, 2a (1881).

*Papilio Dorylas*, Sulz. Gesch. Ins. t. 13, f. 3 (1776).

*Papilio Ægistus*, Cram. Pap. Ex. ii. t. 106, C, D (1779).

Male and Female. Wings above blackish, with the following pale green spots:—anterior wings with nine spots in cell,—one at extreme base, the second large and transversely oblique, the ninth near apex,—two small spots beyond cell, two small subapical spots, an oblique discal series of eight larger spots,—the uppermost placed above the upper discoidal nervule, the first to the fifth gradually increasing in size, the sixth and seventh *sometimes divided and duplex*, the eighth basal,—a submarginal series of smaller spots and a spot on inner margin; posterior wings with three costal greyish spots and the following pale green spots:—two elongate and subparallel with abdominal margin, followed by a curved discal series of five spots and a submarginal series of spots, the one at anal angle being very small, two greyish streaks

on abdominal fold, the innermost being more more or less—mostly so in female—greenish. Wings beneath with the ground colour purplish-brown, mottled with darker patches; anterior wings with the spots as above; posterior wings with two additional and contiguous pale green spots at base, spots generally more obscure than above, a large greyish-white spot near costa inwardly margined with a black and red spot, a black and red spot close to the upper discal green spot, the lower discal spot with a black centre, the marginal spots more or less margined with blackish, a small whitish fringe-like spot above anal angle preceded by a reddish spot bordered with greyish and black; abdominal fold dark greyish, sometimes more or less greenish. Body above brownish, with a broad central black fascia, which is margined with greenish on pronotum and with greyish on abdomen; inner margin of eyes greyish; body beneath greyish; legs streaked with dark fuscous.

Exp. wings, ♂ and ♀, 66 to 95 millim.

HAB.—Continental India; Silhet, Dukhun (Horsf. & Moore); Darjeeling (coll. Dist.).—Ceylon (Moore).—Andaman Islands; Port Blair (Wood-Mas. and de Nic.).—Nicobar Islands; Kamorta (Moore).—Burma; Moulmein (Moore).—Tenasserim; Meetan, Hatsiega, Hougnduran Source (Limborg—Moore).—Malay Peninsula; Penang, Province Wellesley (coll. Dist.); Perak (Künst.—Calc. Mus.); Malacca (Pinwill—Brit. Mus.).—Siam; Chentaboon (Druce).—Nias Island (Kheil).—Sumatra (Forbes—coll. Dist.).—Java (Horsf. & Moore); Batavia (Snellen).—Borneo (Voll.); Elodina (Pryer—coll. Dist.); Bangermasin (coll. Dist.).—Philippines (Semper).—Celebes (Snell.).—Amboina (Voll.).—Cochin China (Oberth.).

The larva and pupa of this species have been figured by Horsfield,\* and the larva in Java is stated to feed on the same plant as *P. antiphates*.† The larva and pupa are also figured from drawings made by the Bros. de Alwis in Moore's 'Lepidoptera of Ceylon,'‡ and the larva in Ceylon is said to feed on *Magnoliaceæ* and *Anonaceæ*, and also—on the authority of Mr. Mackwood—on "Soursop and Cinnamon,"§ whilst both in Batavia and South-West Celebes M. C. Piepers found it "feeding on the leaves of *Anona muricata*, Linn., a plant introduced from the West Indies."||

This species is of a varietal nature, and several local races appear to have a moderately distinct facies. Thus the length of the caudate appendages to the posterior wings is longer in specimens found in Continental India than in the Malay Peninsula, whilst Celebesian examples can easily be recognised by their generally larger size and smaller spots. ¶

\* Cat. Lep. Mus. E. I. C. vol. i. t. 111, f. 9, 9a. † *Antea*, p. 359. ‡ T. 63, f. 2, 2a. § *Ibid.* p. 145.

|| *Tijd. Ent.* xix. pp. xviii to xxiv, and English translation by Kirby, 'Entomologist,' x. p. 272.

Fritz Müller has recently given some interesting facts as to the botanical discrimination of butterflies. Writing from Santa Catharina, Brazil, he remarks:—"The caterpillars of *Mechanitis*, *Dircenna*, *Ceratinia*, and *Ithomia* feed on different species of *Solanaceæ* (*Solanum*, *Cyphomandra*, *Bassonia*, *Cestrum*), those of the allied genera *Thyridia* on *Brunfelsia*. Now this latter genus of plants had been placed unanimously among the *Scrophularinæ*, till quite recently it was transferred by Bentham and Hooker to the *Solanaceæ*. Thus it appears that butterflies had recognised the true affinity of *Brunfelsia* long before botanists did so. . . . There is yet another and more curious instance of our butterflies confirming the arrangement of plants in Bentham and Hooker's 'Genera Plantarum.' *Ageronia* and *Didonis* were formerly widely separated by lepidopterists, being even considered as constituting distinct families, but now they are to be found beside one another among the *Nymphaliniæ*, and the structure of their caterpillars leaves no doubt about their close affinity. The caterpillars of *Ageronia* feed on *Dalechampia*, those of *Didonis* on *Tragia*. Now these two Euphorbiaceous genera were widely separated by Endlicher, who placed the former among the *Euphorbiæ*, the latter among the *Acalyphææ*; Bentham and Hooker, on the contrary, place them close together in the same sub-tribe of *Plukeneticeæ*, and thus their close affinity, which had been only appreciated by butterflies, has finally been recognised by botanists also."—('Nature,' vol. xxx., p. 240.)

¶ Mr. Wallace enumerates six local forms of this species (*Trans. Linn. Soc.*, vol. xxv., pp. 67-8 (1855), and *Mou. Oberthur* has more recently described two under distinct varietal names (*Études d'Ent. Quatr. Livr.*, p. 58 (1879).

## Genus LEPTOCIRCUS.

*Leptocircus*, Swainson, Zool. Ill. Ins. ii. p. 106 (1832-33); Boisd. Sp. Gén. i. p. 380 (1836); Doubl. Gen. Diurn. Lep. p. 22 (1847).

*Lamproptera*, Gray, Griff. Ann. Kingd. xv. t. 102, f. 4 (1832).

This genus, as already pointed out (*antea*, p. 324), differs from *Papilio* in all its sectional groups, by having the third, fourth, and fifth subcostal nervules of the anterior wings with a common origin. More detailed diagnosis appears unnecessary here, as these characters are not only clearly defined, but the general facies of the species are almost indicative of the genus.

*Leptocircus* seems well and naturally classified in a position intermediate between the "Swallow-tail" Papilios and the Hesperiidæ, many species of which—especially from Tropical America—have more or less similar caudate prolongations to the posterior wings.

The genus is not of large extent, and is purely Eastern in distribution. It appears to be confined to the Indo-Malayan region, and other portions of the Malayan Archipelago.

Two species are here recorded as from the Malay Peninsula.

1. *Leptocircus meges*. (Tab. XXXII., fig. 3.)

*Papilio MeGES*, Zinken-Sommer, Nova Acta Ac. Nat. Cur. xv. p. 161, t. 15, f. 8 (1831).

*Erycina Curius*, Godt. Enc. Méth. ix. Suppl. p. 827 (1823).

*Lamproptera Curius*, Gray, Griff. An. Kingd. xv. t. 102, f. 4 (1832).

*Leptocircus Curius*, Swains. Zool. Ill. Ins. ii. t. 106 (1833); Boisd. Sp. Gén. i. p. 381, t. 7, f. 1 (1836).

*Leptocircus MeGES*, Doubl. Zool. i. pp. 110, 111, fig. (1843); Gray, Cat. Lep. Papil. p. 73, n. 337 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 85, n. 173 (1857); Feld. Spec. Lepid. Papil. p. 1, n. 2 (1864); Reak. (part), Proc. Ent. Soc. Phil. iii. p. 494, n. 29 (1864); Wall. Trans. Linn. Soc. vol. xxv. p. 68, n. 120 (1865).

Male and Female. Anterior wings above pale hyaline, the neuration, the margins, and basal half black, the black area being divided by a broad, pale greenish fascia; posterior wings black, a greenish fascia parallel and similar to that on anterior wings, but attenuated posteriorly, and not extending beyond the central area; the anal-angular area and caudate appendages dusted with greenish scales, the lower half of fringe, inner margins and apices of caudate appendages greyish-white. Wings beneath as above, but inner area of both wings pale greenish, thus giving the appearance of two greenish fasciæ, the central fascia greyish on posterior wings, and the posterior wings with the abdominal margin above anal angle marked with three oblique pale greenish stripes. Body above black; beneath, with legs, greyish-white; legs streaked with blackish.

Exp. wings, 45 millim.

HAB.—Continental India; Silhet, Assam (Feld.).—Malay Peninsula; Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Feld. and Wall.).—Java (Zink. and Wall.).

In February, 1884, my friend Capt. Godfery sent me some interesting observations on this species. He wrote:—"In Perak . . . I invariably found this butterfly over running water, and its appearance was so peculiar that, had I not known what to expect, I might almost have passed it by, thinking it was not one. The transparent wings and long streaming tails give it a certain resemblance to a dragon-fly, and since its haunts are by the water-side, this may be of service to the insect. Its flight, however, hardly bears out this resemblance, consisting of a kind of dancing motion,—a series of mid-air jumps, so to speak,—very different to the direct swift flight or the steady hovering motion of the *Libellulidæ*. Still the rapid

vibration of its transparent wings strongly reminded me of the dragon-fly, and it is possible that it sometimes hovers in its flight, after the manner of the latter, though I did not see it do so."

Subsequent to the above, and with reference to another species, Mr. Forbes has published similar observations made in Sumatra:—"By the margin of a small stream I caught *Leptocircus virescens*, which derives protection from mimicking the habits and appearance of a dragon-fly, in a crowd of which it is often to be found. In form it reminded me of the European genus *Nemoptera*. It flits over the top of the water, fluttering its tails, jerking up and down just as dragon-flies do when flicking the water with the tip of their abdomens. When it settles on the ground it is difficult to see, as it vibrates in constant motion its tail and wings, so that a mere haze, as it were, exists where it rests."\*

## 2. *Leptocircus curius*. (Tab. XLII., fig. 1.)

*Papilio Curius*, Fabricius, Mant. Ins. ii. p. 9, n. 71 (1787); Ent. Syst. iii. p. 28, n. 81 (1793); Don. Ins. Ind. t. 47, f. 1 (1800).

*Erycina Curius*, Godt. Enc. Méth. ix. p. 564, n. 5 (1823).

*Leptocircus Curius*, Gray, Cat. Lep. Papil. p. 73, n. 336 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 85, n. 172 (1857); Feld. Spec. Lepid. Pap. p. 1, n. 5 (1864); Moore, Proc. Zool. Soc. 1865, p. 758; Wall. Trans. Linn. Soc. vol. xxv. p. 69, n. 123 (1865); Butl. Cat. Fabr. Lep. p. 259, n. 1 (1869); Kheil, Rhop. der Insel Nias. p. 37, n. 144 (1884).

Male and Female. Differs from *L. meges* by the smaller size, less elongated caudate appendages to the posterior wings, the greater expanse of the opaque black area to the anterior wings, and by the green fasciæ to the wings of *L. meges* being replaced by much narrower and white fasciæ in *L. curius*.

Exp. wings, 38 to 40 millim.

HAB.—Continental India; Cherra Poonjee (Horsf. & Moore); Silhet, Assam (Feld.).—Burma; Moulmein (Feld.).—Malay Peninsula; Perak (coll. Godfery); Malacca (Feld.).—Siam (Feld.).—Sumatra (Forbes—coll. Dist.); Nias Island (Kheil).—Java (Wallace and Brit. Mus.).—Borneo; Sarawak (coll. Dist.).

In Bengal this species has been described by Mr. A. Grote, as "Found only on the slopes of the hills to the eastward and north-eastward." †

## Fam. HESPERIIDÆ.

*Hesperida*, Leach, Sam. Comp. p. 242 (1819); Westw. Gen. Diurn. Lep. p. 505 (1852); Bates, Journ. Entomol. vol. i. p. 219 (1861); ib. vol. ii. p. 177 (1864); Trimen, Rhop. Afr. Austr. p. 285 (1866); Marsh. & De Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 18 (1882).

*Hesperiidæ*, Westw. Introd. Mod. Class. Ins. vol. ii. p. 360 (1840); Moore, Lep. Ceyl. vol. i. p. 156 (1881).

*Urbicola*, Scudd. Trans. Amer. Ent. Soc. vol. vi. p. 69 (1877).

Six perfect legs in both sexes; posterior tibiæ, with few exceptions, having two pairs of spurs. Antennæ generally curved or hooked at apices. Pupa secured by many threads, or enclosed in a slight cocoon.

The classificatory position of this family is unequivocal, and forms a connecting link between the Papilioninous portion of the Rhopalocera and the Heterocera or Moths. ‡ When

\* 'Nat. Wand. East. Archipel.' p. 139.

† Proc. Zool. Soc. 1865, p. 758.

‡ Dr. Speyer has well pointed out that the *Hesperiidæ* are still more characterised as a genealogical transition group, between the Heterocera and the Rhopalocera, in that they possess, in particular cases, two characteristic physiological and anatomical peculiarities—the position of the wings when at rest, and the catch-bristle (*haftborste*) of the hind wings (Stett. Ent. Zeit. 1878, pp. 167—193, and Eng. Transl. Canad. Ent. vol. x. p. 123 (1878)).

we examine the many aberrant characters possessed by the *Hesperiidæ* it is difficult to refuse them a more distinct position than is possessed by any of the other families of butterflies. Thus the peculiar and diverse positions of the wings in repose have already been alluded to (*antea*, p. 1, *note*), whilst the generally hooked antennæ and the frequently chrysalid form of pupation show how close is their relationship to the Moths. As Mr. Scudder has remarked, "Doubtless these skippers\* first separated from the common stock and never developed to a high degree, since they still remain by far the lowest of the group, and are in many points more closely allied to some of the higher moths than they are to any other butterflies." †

Amongst the many peculiar habits of these obscure but interesting butterflies, is their mode of flight, which in Ceylon has been described by the late Dr. Thwaites as not uniform:—"Some flit about with the greatest activity during the very hottest hours of the day, whilst others are somewhat moth-like, making their appearance in the early morning or late in the evening." ‡ Mr. P. H. Gosse has recorded some curious experiences in breeding these butterflies in Alabama. He writes:—"I have bred very many butterflies, and have universally found them, on first opening the dark box in which they have been evolved, perfectly still, and making no attempt to escape when touched with the fingers; but these Skippers formed a singular exception. Before the lid was half raised, all was scuffle and flutter within, the first intimation I had of their birth; though, as I had examined them every day, I knew by the discoloration of the pupa that the change was near." § Prof. Westwood quotes Mr. Curtis as mentioning the curious circumstance that old specimens, when alive, have frequently lost one or both of their palpi, an accident he had only observed amongst the *Heterocerous Pyralidæ*. ||

The classification of the genera of these obscure butterflies has long been a stumbling-block to systematists, but has recently received considerable attention from many excellent lepidopterists. The two earliest systems proposed were those of Hübner and Latreille. That of the first author is uncritical, his eight divisions or families being founded either on the shape or colour-markings of the wings, and is therefore more or less superficial in character. That of Latreille, published in the 'Encyclopédie Méthodique,' is much more exhaustive, but based greatly on similar characters to those relied upon by Hübner. In 1873 Mr. S. Scudder advocated the partition of the family into two main divisions, to which he applied the names of *Hesperides* and *Astyci*, terms previously used by Latreille and Hübner. The chief diagnosis of these divisions is thus given:—"In the *Hesperides* the fore wing of the male is always provided with a costal fold where a sort of silky down is concealed; this feature is often very

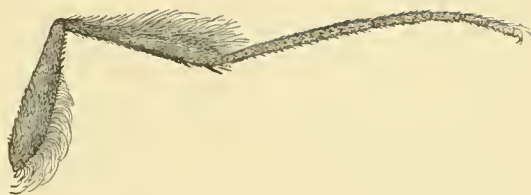


FIG. 110.—Posterior leg of *Erionota thrax*.

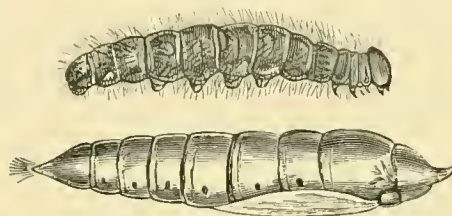


FIG. 111.—Larva and pupa of *Erionota thrax*.  
(From Horsf. & Moore, *Cat. Lep. Mus. E. I. C.*)

\* A colloquial name given to the *Hesperiidæ*, on account of the short, jerking flight of the species.

† *Trans. Amer. Ent. Soc.* vi. p. 69 (1877).

‡ *Moore's Lep. Ceylon*, vol. i. p. 156 (1881).

§ 'Letters from Alabama,' p. 86.

|| *Introd. Mod. Class. Ins.* ii. p. 360.

inconspicuous. In the *Astyei*, on the other hand, the male is generally furnished with a discal patch of peculiar scales crossing the median interspaces of the fore wings, usually in an oblique direction; but sometimes the wing of the male is as simple as that of the female. In the male *Hesperides*, again, the posterior extremity of the alimentary canal is protected beneath by a corneous sheath, which extends beyond the centrum or body of the upper pair of abdominal appendages, carrying the vent beyond the centrum; while in the *Astyei*, the extremity of the canal is not protected by any extruded sheath, but opens at the very base of the inferior wall of the centrum."\* In 1876 Mon. Paul Mabille, who has considerably and specially studied the *Hesperiidae* commended this classification,† and in the following year enumerated and described the species contained in the Brussels Museum under these main divisions, which he again subdivided into several tribes.

In 1878 a thoroughly exhaustive and model contribution to this problem appeared from the pen of Dr. A. Speyer, ‡ who notices, but does not altogether follow, Mr. Scudder. In the revision of the European *Hesperiidae*, Dr. Speyer places considerable value on the presence or absence of an appendage to the anterior tibiæ as a character to be used in grouping the genera. Dr. Speyer thus describes this structural character:—"The appendage to the anterior tibiæ (epiphysis cruralis, *schienblattchen*), a bare, mostly reddish-yellow, blunt thorn-shaped, or lancet-shaped, chitinous plate projects, in the *Hesperiidae*, from the middle of the inner side of the tibiæ and reaches to their end. It lies quite close to the tibiæ, and its free surface is clothed with a flat tuft of hairs, so that the structure is sometimes not readily recognised." In his diagnostic table of the genera, Dr. Speyer uses the presence or absence of this character as a means of sectional division.

Herr C. Plötz, in 1879, gave a synopsis of genera, § and has since followed that paper by the publication of a list of the species contained in many of those genera, whilst Mr. F. Moore has further studied the family, and described many new genera, some of which embrace species found in this fauna.

Although reference has thus been made to much recent work devoted to the *Hesperiidae*, it is only too apparent that no natural classification and arrangement have yet been formulated which are applicable to the whole family. As, however, in a work of this nature, some system must be adopted, the writer has followed the same scheme of classification as was used with the *Lycenidae*, and has divided the genera into two groups:—

Posterior wings more or less elongate, distinctly longer than broad.	-	-	-	-	ISMENARIA.
Posterior wings more or less convex, about as broad as long.	-	-	-	-	ERIONOTARIA.

#### Group ISMENARIA.

This group is widely distributed, and it is in Tropical America, that the utmost elongation, combined with caudate prolongation of the posterior wings, are found.

\* Bull. Buff. Soc. Nat. Sci. vol. i. p. 197.

† Ann. Soc. Ent. Fr. (5), vi. p. 251 *et seq.*

‡ Stett. Ent. Zeit. 1878, pp. 167—193, and Engl. Transl. Canad. Ent. vol. x. pp. 121, 144, and 163.

§ Stett. Ent. Zeit. 1879, p. 175.

SYNOPSIS OF GENERA.

- A. Posterior wings with the outer margin sinuated or more or less lobately produced near anal angle.
  - a. Outer margin of anterior wings a little longer than inner margin.
    - b. Upper disco-cellular nervule of anterior wings distinctly longer than lower.
      - c. Disco-cellular nervules of anterior wings obliquely directed inwardly. - - - - - UNKANA.\*
    - bb. Upper disco-cellular nervule of anterior wings slightly longer than lower.
      - cc. Disco-cellular nervules of anterior wings suberect. - - - - - LOTONGUS.†
  - aa. Outer margin of anterior wings subequal in length to inner margin.
    - ccc. Disco-cellular nervules of anterior wings about equal in length, or lower a little longer than upper.
      - d. Cell of anterior wings not attenuated anteriorly.
        - e. Wings not furnished with pseudo-scent glands.‡
          - f. Base of second median nervule of anterior wings about twice as far apart from that of the lower as from that of the upper median nervule. - - - - - CHOASPES.
          - ff. Base of second median nervule of anterior wings about midway between the base of first and third median nervules. - - - - - HASORA.
          - ee. Wings provided with pseudo-scent glands. - - - - - PADUKA.§
        - dd. Cell of anterior wings attenuated anteriorly. - - - - - MATAPA.
      - eccc. Upper disco-cellular nervule of anterior wings longer than lower.
        - g. Upper median nervules of anterior wings close together, remote from lower. - - - - - PIRDANA.||
        - gg. Base of second median nervule of anterior wings about twice as far apart from that of the lower as from that of the upper median nervule.
          - h. Upper disco-cellular nervule of anterior wings moderately oblique. - - - - - ZEA.¶
          - hh. Upper disco-cellular nervule of anterior wings very oblique. - - - - - BAORIS.
        - ggg. Base of second median nervule of anterior wings less than twice as far apart from that of the lower as from that of the upper median nervule. - - - - - PITHAURIA.
        - gggg. Base of second median nervule of anterior wings about midway between that of upper and lower median nervules, or rather nearer to the lower. - - - - - TELICOTA.
- B. Posterior wings with the outer margin neither sinuated nor lobately produced at anal angle.
  - i. Base of second median nervule of anterior wings about, or little more than, twice as far apart from that of the lower as from that of the upper median nervule.
    - j. Antennæ with their apices strongly hooked. - - - - - SATARUPA.
    - jj. Antennæ with their apices curved, but not strongly hooked. - - - - - CASYAPA.
  - ii. Base of second median nervule of anterior wings about three times as far distant from that of the lower as from that of the upper median nervule.
    - k. Disco-cellular nervules of anterior wings oblique. - - - - - ISMA.\*\*
    - kk. Disco-cellular nervules of anterior wings suberect. - - - - - TAGIADES.
- C. Posterior wings with the outer margin angularly produced near apex.

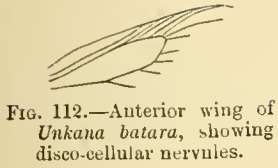


FIG. 112.—Anterior wing of *Unkana batara*, showing disco-cellular nervules.

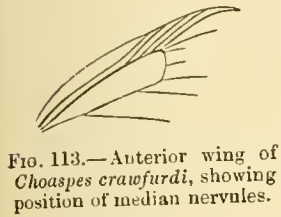


FIG. 113.—Anterior wing of *Choaspes crawfurdi*, showing position of median nervules.

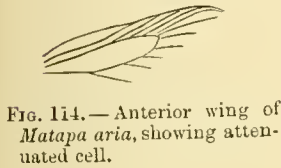


FIG. 114.—Anterior wing of *Matapa aria*, showing attenuated cell.

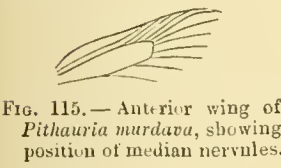


FIG. 115.—Anterior wing of *Pithauria murdava*, showing position of median nervules.

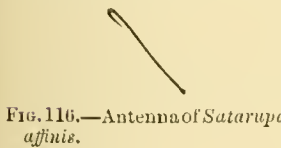


FIG. 116.—Antenna of *Satarupa affinis*.

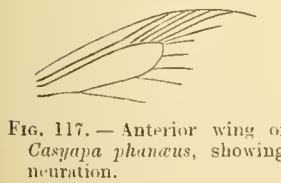


FIG. 117.—Anterior wing of *Casyapa phaneus*, showing neurulation.

\* Gen. nov., type *Unkana batara*, Dist. † Gen. nov., type *Eudamus calathus*, Hew.  
 ‡ In using the term "pseudo-scent glands," I do not necessarily question the results of such careful investigators as Fritz Müller, Wood-Mason, and others on this point, and only think it necessary to make this remark, as Mr. Butler, of the British Museum, has thought it necessary to record the remarkable opinion that, "in nine cases out of ten," he considers these suggestions as "the most pitiable nonsense" (Ent. Month. Mag. vol. xxi. p. 247). "Audi alteram partem."  
 § Gen. nov., type *Paduka glandulosa*, Dist. || Gen. nov., type *Hesperia hyela*, Hew.  
 ¶ " " " *Pamphila mytheica*, Hew. \*\* " " *Isma obscura*, Dist.

## Genus UNKANA.

*Unkana*, Distant, *antea*, p. 369.

Anterior wings elongate; costal margin moderately convex, outer margin oblique, inner margin nearly straight, a little shorter than outer margin. Costal nervure extending to about half the length of costal margin; first subcostal nervule emitted at about one-third before end of cell; second, third, and fourth emitted at about equal distances apart between base of first and end of cell; fifth from end of cell: disco-cellular nervules obliquely directed inwardly, the upper distinctly longer than the lower; second median nervule emitted much nearer upper than lower median nervule. Posterior wings elongate and somewhat lobately produced near anal angle, the outer margin obliquely convex. Subcostal nervules bifurcating beyond middle of cell; second median nervule emitted nearer to upper than lower median nervule. Body robust; palpi broad and pilose; antennæ moderately long, their apices incrassated, with the tip attenuated and curved or hooked; legs long, anterior tibiæ short and thickened; posterior tibiæ with two long and prominent spines near apex.

*Unkana* is allied to *Badamia*, Moore, and includes three species which are at present known as found in this fauna.

1. *Unkana batara*. (Tab. XXXIV., fig. 11.)

*Ismene batara*, Moore, MS.\*

Wings above dark fuliginous; anterior wings with three large irregular pale discal spots, one in and beyond middle of cell, and two beneath cell divided by the second median nervule: beyond these are six minute pale spots, four in oblique series directed outwardly situate beyond upper end of cell, and two separated by the lower discoidal nervule; a pale streak near centre of inner margin; posterior wings with the fringe very pale ochraceous. Anterior wings beneath with the costal and apical areas pale steely bluish, and the pale spots above ochraceous beneath; posterior wings bluish-grey, a spot near apex and the anal-angular area dark fuliginous. Body above and beneath more or less concolorous with wings.

Exp. wings, 52 millim.

HAB.—Malay Peninsula; Malacca (Biggs—coll. Dist.); Singapore (coll. Staudinger).—Java (Horsf. and Moore).

This appears to be a moderately scarce species,—at least in collections,—though such comparatively little ardour has been shown in the capture of *Hesperidae* that few correct conclusions can be formed on these questions.

2. *Unkana elia*. (Tab. XXXIV., fig. 25, *var.*.)

*Hesperia Elia*, Hewitson, Trans. Ent. Soc. ser. 3, vol. ii. p. 489, n. 9 (1866).

*Carystus Elia*, Druce, Proc. Zool. Soc. 1873, p. 359, n. 2.

*Cobalus elia*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 554, n. 1 (1877).

Wings above dark fuliginous; anterior wings with nine pale irregularly formed spots, of which five in oblique series extend from between the discoidal nervules to the submedian nervure, three in almost perpendicular series divided by the fourth and fifth subcostal nervules, and one in and near end of cell; posterior wings with a transverse discal macular pale greyish fascia commencing at discoidal nervule, and the abdominal-marginal area also largely of the same colour. Wings beneath a little paler than above;

\* This species is enumerated, but *not described*, in Horsfield and Moore's Cat. Lep. Mus. E. I. C. vol. i. p. 249, n. 555 (1857).



anterior wings spotted as above; posterior wings with about the basal half pale greyish, the costal area and a patch at base of cell fuliginous. Body more or less concolorous with wings.

*Var.*—Posterior wings above having the transverse, discal macular fascia narrower than in specimen figured, and the pale coloration at abdominal margin also considerably more restricted.

Exp. wings, 47 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.; coll. Staud.); Singapore (Godfery—coll. Dist.).—Sumatra (Hewits.).—Borneo (Druce).

The above described varietal characters may possibly be of a sexual nature, but the material now before the writer is not sufficient to warrant a conclusion on that point.

### 3. *Unkana attina*. (Tab. XXXIV., fig. 30.)

*Hesperia attina*, Hewitson, Trans. Ent. Soc. ser. 3, vol. ii. p. 489, n. 10 (1866); Plötz, Stett. Ent. Zeit. xliii. p. 339, n. 122 (1882).

*Hesperia Latreillii*, Feld. Reise Nov. Lep. iii. p. 511, n. 892, t. 71, f. 8 (1866).

Wings above dark fuliginous; anterior wings with eight pale irregular spots, of which four are in oblique series from upper discoidal nervule to lower median nervule, three divided by the fourth and fifth subcostal nervules, and one in cell; posterior wings with the disk pale greyish. Wings beneath somewhat paler than above; anterior wings spotted as above, and with some submarginal greyish streaks near apex; posterior wings with the pale discal area much larger than above, and extending to the outer margin between apex and median nervules. Body more or less concolorous with wings.

Exp. wings, 55 millim.

HAB.—India, *sic.* (Hewitson).—Malay Peninsula; Malacca (Biggs—coll. Dist.).—Java (Feld. and Hewits.).

## Genus LOTONGUS.

*Lotongus*, Distant, *antea*, p. 369.

This genus is allied to *Unkana* in having the outer margin of the anterior wings a little longer than the inner margin, but differing by having the upper disco-cellular nervule of the anterior wings only slightly longer than the lower, and the disco-cellular nervules suberect, and not oblique as in *Unkana*.\*

Two species belonging to *Lotongus* are found in the Malay Peninsula, and are here enumerated.

### 1. *Lotongus calathus*. (Tab. XXIV., fig. 14.)

*Eulamus Calathus*, Hewitson, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 353 (1876).

Wings above dark fuliginous; anterior wings with three large pale contiguous discal spots situate one in and near end of cell, and two beneath divided by the second median nervule, a small pale spot near centre of submedian nervule, and a smaller and more obscure pale spot beyond cell; posterior wings paler than anterior with the apex and the fringe pale ochraceous. Wings beneath as above, but anterior wings having the pale discal spots united to the costa and to the inner margin by pale greyish ochraceous; posterior wings having the apex more continuously pale ochraceous than above. Body more or less concolorous with wings.

Exp. wings, 47 millim.

HAB.—Malay Peninsula; Malacca (Biggs—coll. Dist.).—Sumatra (Hewits.).

\* The writer has thought it best, in describing genera belonging to the *Hesperidae*, to give comparative, rather than more exhaustive but less easily understood diagnosis.

This species is at present scarce in collections. I am indebted to the Rev. L. Biggs for the possession of two Malaccan specimens, and these are the only examples from the Malay Peninsula with which I am at present acquainted.

2. *Lotongus maculatus*, *n. sp.* (Tab. XXXV., fig. 1.)

Allied to *L. calathus*, but differing from that species above by having the three large discal spots replaced by four smaller ones and by the absence of the ochraceous apex to the posterior wings; wings beneath as in *L. calathus*, but the discal macular fascia to the anterior wings somewhat narrower, and containing a central fuliginous spot. Body more or less concolorous with wings.

Exp. wings, 47 millim.

HAB.—Malay Peninsula; Malacca (Biggs—coll. Dist.).

This is another species discovered in Malacca by the Rev. L. C. Biggs.

Genus CHOASPES.

*Choaspes*, Moore, Lep. Ceyl. vol. i. p. 158 (1881).

Anterior wings subtriangular, costal margin arched at base, outer margin obliquely convex, inner margin nearly straight. Costal nervure terminating on costal margin nearly opposite end of cell; fourth and fifth subcostal nervules emitted somewhat close together near end of cell; disco-cellular nervules almost subequal in length, and obliquely directed inwardly; base of second median nervule about twice as far apart from that of the lower as from that of the upper median nervule. Posterior wings elongate, more or less lobately produced at anal angle. Subcostal nervules bifurcating at about one-third before end of cell; first and second median nervules with an apparently common origin at end of cell. Body very robust; palpi broad, flattened, and coarsely pilose, apical joint long, naked, and cylindrical; antennæ with the apex long, curved, and slender; femora pilose.

This genus appears to be truly Oriental in distribution; it is allied to *Ismene*, but apart from other structural characters the males have no "glandular patch of raised scales" on the anterior wings, as is found in species of *Ismene*.

1. *Choaspes crawfurdi*.\* (Tab. XXXIV., fig. 26.)

*Ismene (Choaspes) Crawfurdi*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. x. p. 247 (1882).

Wings above obscure olivaceous-green, becoming tinged with fuscous towards outer margins. Posterior wings with a large anal-angular bright yellowish patch, inwardly and broadly margined with black, apical portion of abdominal margin also bright yellowish. Wings beneath paler and more metallic-green, the nervures and nervules distinctly darker; posterior wings with a very large bright yellowish anal-angular patch which extends from about middle of abdominal margin to between the second and third median nervules, and which possesses a long black irregular streak on inner side of submedian nervure, two parallel black streaks between the submedian nervure and lower median nervule, and two similarly placed black spots between the second and third median nervules on outer edge of the yellow patch. Body above more or less concolorous with wings; anal tuft yellow; body beneath and legs paler.

Exp. wings, 52 to 58 millim.

HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.); Province Wellesley (coll. Dist.).

\* Named after Jno. Crawford, author of the 'Descriptive Dictionary of the Indian Islands and Adjacent Countries.' &c.

**2. Choaspes harisa.** (Tab. XXXIV., fig. 22 ♂.)

*Ismene Harisa*, Moore, Proc. Zool. Soc. 1865, p. 782; Mab. Ann. Soc. Ent. Belg, xxi. p. 34, n. 105 (1878); Wood-Mas. & de Nic. J. A. S. Beng. vol. L. p. 255, n. 110 (1881); Plötz, Stett. Ent. Zeit. xlv. p. 54, n. 6 (1884).

*Hesperia harisa*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 554, n. 1 (1877).

*Choaspes harisa*, De Nic. J. A. S. Beng. vol. li. p. 64, n. 194, t. x. f. 8 (1882).

Male. Wings above dull vinaceous-brown; anterior wings with the disk somewhat paler and with an ochraceous costal streak; posterior wings with the fringe pale ochraceous and the costal area pale greyish-ochraceous. Wings beneath paler and more ochraceous; anterior wings with a curved pale discal fascia divided by the nervules, and situate just beyond end of cell; inner marginal area pale greyish-ochraceous; posterior wings with the neuration and intermediate linear fasciæ and the fringe brighter ochraceous; a black spot margined with ochraceous at base and a discal curved pale fascia divided by the nervules as on anterior wings. Body and legs more or less concolorous with wings.

Female. The following is Mr. Moore's description of this sex:—"Upper side dark purple-brown; the base of wings greyish, with steel-blue gloss. Body greyish. Cilia of hind wing pale orange-yellow. Underside as in male; posterior margin of fore wing with a less-defined pale patch."\*

Exp. wings, 46 to 50 millim.

HAB.—Continental India; Sikkim (de Nic.); Calcutta (Plötz); Darjeeling (Moore).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (coll. Godfery).

**3. Choaspes chuza.** (Tab. XXXIV., fig. 27.)

*Ismene Chuza*, Hewitson, Ex. Butt. iv. Ism. t. 1, f. 4 (1867); Druce, Proc. Zool. Soc. 1873, p. 358, n. 1; Plötz, Stett. Ent. Zeit. xlv. p. 61, n. 36 (1884).

Wings above dark purplish-brown, their basal area paler; anterior wings with an ochraceous costal streak, three contiguous pale discal spots divided by the nervules and situate at end of cell, and four small white contiguous subapical spots divided by the third, fourth, and fifth subcostal nervules; posterior wings with a broad, central ochraceous fascia, and the fringe of the same colour. Wings beneath paler, particularly their basal areas; markings as above, but the discal spots on anterior wings connected by pale ochraceous to the costal and inner margins. Body above concolorous with wings; body beneath and legs paler.

Exp. wings, 44 to 46 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.); Singapore (coll. Godm. & Salv.).—Borneo (Druce); Sarawak (Hewitson).

**4. Choaspes? malayana.** (Tab. XXXV., fig. 2.)

*Ismene malayana*, Felder, Wien. Ent. Mon. iv. p. 401, n. 28 (1860); Reise Nov. Lep. iii. t. 72, f. 15 (1866).

This species is only known to the writer by Felder's description and figure, both of which are here reproduced. Its generic position is therefore not determined.

"Alis supra fuscis, subtus anticarum limbo costali, posticarum dimidio basali chalybæis, his striga discali alba. ♂."

HAB.—Malay Peninsula; Malacca (Felder).

\* Proc. Zool. Soc. 1865, p. 783.

## Genus HASORA.

*Hasora*, Moore, Lep. Ceyl. vol. i. p. 159 (1881).

*Hasora* principally differs and is most easily distinguished from the previous genus, *Choaspes*, to which it is closely allied, by the position of the second median nervule of the anterior wing, which is emitted about midway between the bases of the first and third median nervules.

According to present knowledge, *Hasora* is a purely Oriental genus, and two species are here included as found in the Malay Peninsula.

1. *Hasora badra*. (Tab. XXXV., fig. 3 ♂.)

*Goniloba Badra*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. vol. i. p. 245, n. 532, t. 7, f. 3, 3a (1857); Proc. Zool. Soc. 1865, p. 778.

*Hesperia Badra*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 554, n. 3 (1877).

*Ismene Badra*, Snell. Tijds. Ent. xxi. p. 41, n. 167 (1878); Wood-Mas. & de Nic. J. A. S. Beng. vol. L. p. 256, n. 111 (1881); Plötz, Stett. Ent. Zeit. xlv. p. 59, n. 25 (1884).

*Hasora Badra*, Moore, Lep. Ceyl. vol. i. p. 159, t. 65, f. 4, a, b (1881); de Nic. J. A. S. Beng. vol. li. p. 65, n. 195 (1882).

Male. Wings above fuliginous-brown; posterior wings with the fringe brownish-grey. Wings beneath paler than above, both wings crossed by a somewhat indistinct dark fuliginous fascia; anterior wings with the inner marginal area pale yellowish-grey; posterior wings with a greyish-white spot in and near end of cell, and a fuliginous submarginal fascia developing into a large and dark fuliginous spot at anal angle, which is preceded by an oblique greyish spot. Body and legs more or less concolorous with wings; palpi and posterior segmental margins beneath yellowish-grey.

*Var.*—Posterior wings beneath having the greyish spot in cell and the greyish streak above anal angle practically obliterated or obsolete.

Female. This sex is figured and described in Mr. Moore's 'Lepidoptera of Ceylon,' and differs from the male in having the anterior wings spotted above; "three small subapical spots . . . and three large obliquely-quadrangle spots, two being disposed on the disc, the third above them within the cell."\*

Exp. wings, 48 to 50 millim.

HAB.—Continental India; Bengal (Moore); Sikkim (de Nic.).—Ceylon (Moore).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Malay Peninsula; Perak (Künstl.—Calc. Mus.); Malacca (Pinwill—Brit. Mus.); Johore (coll. Staud.).—Java (Horsf. & Moore).—Celebes (Snell.).—Philippines (Plötz).

Mr. Moore, in describing both Bengalese and Ceylonese male examples of this species, refers to "three conjugated very small yellowish semitransparent spots near the costa, one fourth from the apex" on the upper surface of the anterior wings, but these spots are practically absent in the few specimens I have examined from the Malay Peninsula.

The larva and pupa of this species as observed in Java are figured by Horsfield, † who describes the first as feeding "upon a leguminous plant bearing the native name of Tungkul."

\* Lep. Ceyl. vol. i. p. 160.

† Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. t. vii. f. 3, 3a.

2. *Hasora vitta*. (Tab. XXXV., fig. 4 ♂.)

*Hesperia Vitta*, Butler, Trans. Ent. Soc. 1870, p. 498 (1870); Lep. Ex. p. 167, t. 59, f. 9 (1874); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 554, n. 2 (1877).

*Ismene Vitta*, Druce, Proc. Zool. Soc. 1873, p. 358, n. 5; Plötz, Stett. Ent. Zeit. xlv. p. 57, n. 18 (1884).

*Ismene Chabrona*, Plötz, Stett. Ent. Zeit. xlv. p. 56, n. 16 (1884).

Male. Wings above dark fuliginous-brown; anterior wings with three (frequently only one) very small greyish subapical spots; posterior wings with the fringe greyish-brown, the anal angle more or less suffused with darker fuliginous. Wings beneath paler than above, more or less suffused with obscure violaceous; anterior wings with an outer submarginal dark fuliginous fascia and with subapical small greyish spots as above; posterior wings with a narrow oblique greyish-white fascia crossing wing from costal margin to near anal angle, which is occupied by a large blackish spot, with a greyish-white spot on its upper inner margin and a linear greyish-white spot on its outer lower margin. Body and legs more or less concolorous with wings; palpi and anal tuft beneath greyish-ochraceous.

Exp. wings, ♂, 43 to 45 millim.

HAB.—Malay Peninsula; Perak (Künst.—Calc. Mus.); Malacca (Plötz; Pinwill—Brit. Mus.).—Borneo (Druce); Sarawak (Butl.).—Philippines (Plötz).

I feel little hesitation in placing the *I. Chabrona*, Plötz, as the female, and therefore synonym, of this species. I have not seen a female specimen, but the description of Plötz specifies spotted anterior wings combined with all the other characters of *H. vitta*, which are in unison with the differential sexual characters which obtain in the previously described species, *H. badra*.

Some amount of variation is apparent in the width of the greyish-white fascia on the under surface of the anterior wings.

## Genus PADUKA.

*Paduka*, Distant, *antea*, p. 369.

Anterior wings elongate, subtriangular; costal margin oblique, outer margin nearly straight, inner margin very slightly rounded. Costal nervure terminating on costa a little before the end of cell, first subcostal nervule emitted a little beyond middle of cell; second, third, and fourth subcostal nervules about equal distances apart, fifth from near end of cell; disco-cellular nervules about equal in length, the upper suberect, the lower obliquely directed inwardly; middle median nervule slightly nearer upper than lower. Posterior wings with the costal margin rounded, the outer margin sinuated and somewhat lobately produced at anal angle; subcostal nervules bifurcating about middle of cell; median nervules with their bases moderately close together. Body robust, pilose, the hairs forming several prominent tufts, of which the most noticeable are three in triangular series above base of abdomen. Palpi broad and coarsely pilose. Legs longly pilose beneath. Antennæ somewhat long and slender, with a moderately formed club, its apex attenuated and strongly curved or hooked.

Male. Anterior wings above with a large discal patch of silky hairs extending to base along the median nervure, and an elongate patch of long silky hairs on base of inner margin. Posterior wings above with long silky hairs at base and along submedian nervure, and with two prominent discal elongate glandular pouches—or pseudo-scent glands—situate on the second and third median nervules. Anterior wings beneath with a long tuft of coarse hairs on the submedian nervure.

The extraordinary butterfly for the reception of which I have been compelled to propose this genus, is contained in the collection of Dr. Staudinger, who has obligingly placed it

in my hands for figuring and identification. It appears to exhibit a maximum of glandular development.

1. *Paduka glandulosa*, *n. sp.* (Tab. XXXV., fig. 5, ♂.)

Male. Wings above dark fuliginous-brown; anterior wings with a large discal patch of dark fuscous silky hairs; posterior wings with the fringe pale ochraceous, and with two pale raised discal elongate glandular pouches situate on the second and third median nervules. Wings beneath paler than above; anterior wings with the disk darkest, the inner area palest, and with a long tuft of coarse pale ochraceous hairs on the submedian nervure; posterior wings with a transverse discal pale ochraceous fascia. Body and legs more or less concolorous with wings. Antennæ blackish, their hooked apices ochraceous.

Exp. wings, ♂, 55 millim.

HAB.—Malay Peninsula; Singapore (coll. Staudinger).

Genus PIRDANA.

*Pirdana*, Distant, *antea*, p. 369.

This genus principally differs from the preceding—*Paduka*—in the following characters:—The upper disco-cellular nervule of the anterior wing is longer than the lower; the first and second median nervules of the same wing are emitted moderately close together and remote from the lower median nervule; and there is a complete absence of the glandular patches and pouches as found in *Paduka*.

This genus will also contain the *Hesperia ismene*, Feld.,\* a Celebesian species.

1. *Pirdana hyela*. (Tab. XXXV., fig. 6 ♀.)

*Hesperia Hyela*, Hewitson, Desc. Hesp. p. 23, n. 2 (1867).

Female. Wings above very dark fuscous, the basal areas of both wings somewhat extensively bluish-green; posterior wings with the anal-angular area bright orange-yellow, the fringe yellowish-grey. Wings beneath extensively shaded with bluish-grey, with darker reflections between the nervules; anterior wings purplish-brown between the two lower median nervules, the inner area pale yellowish-grey; posterior wings with the anal-angular area and the fringe as above. Body above more or less concolorous with wings, beneath somewhat yellowish-grey; legs brownish.

Exp. wings, ♀, 45 millim.

HAB.—Malay Peninsula; Sungei Ujong (coll. Godfery).—Java (Hewitson).

I have examined a Malaccan male specimen in the collection of Dr. Staudinger, which may prove to be the male of this species, but which is unfortunately so *rubbed* beneath as to make exact determination somewhat hazardous. This specimen is dark obscure chocolate-brown above, with the anal-angular area orange-yellow as in the female. If this is really the other sex, as I strongly suspect, then Mr. Hewitson erroneously described the female as a male.

\* This species has been included by Mabilie in his genus *Tanyptera* (Ann. Soc. Ent. Belg. xxi. p. 33, 1878), but erroneously. That genus was first applied to a West African species, the *Hesperia laufella*, Hew., which may therefore be taken as the type, of which the neuration is quite distinct from the species included in *Pirdana*. The name *Tanyptera* is also pre-occupied, having been used for a genus in Diptera (1804).

## Genus ZEA.

*Zea*, Distant, *antea*, p. 369.

This genus is allied to the preceding in general characteristics and in having the upper disco-cellular nervule of the anterior wings a little longer than the lower; but it strongly differs from *Pirdana* by the position of the median nervules of the anterior wings, the second of which has its base only about twice as far apart from that of the lower as from that of the upper median nervule.

It is probable, looking at the many superficially allied but structurally or generically distinct species of *Hesperiidae*, that in this family much generic separation must be made before these butterflies can be rightly understood, or their distribution in any way studied; and whilst this generic separation can be effected by the recognition of such structural characters, as may be clearly expressed in words, and capable of synoptical illustration with reference to other genera, the work is necessary and to be commended. But when a supposed genus is better known by its name than separable by its characters, it becomes but a term of a catalogue and an encumbrance to Science.\*

1. *Yea mythea*. (Tab. XXXV., fig. 7.)

*Hesperia mythea*, Hewitson, Ann. & Mag. Nat. Hist. ser. iv. vol. 19, p. 81 (1877).

Female. Wings above dark fuliginous-brown; anterior wings with three pale yellow discal spots, one in cell and two beneath, divided by the second median nervule, a fourth very small greyish spot above upper end of cell. Anterior wings beneath as above; posterior wings beneath with a very broad silvery-white discal fascia commencing on costa and terminating near the submedian nervule. Body and legs more or less concolorous with wings.

Exp. wings, 50 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).

The type, in the collection of Dr. Staudinger, is here figured and described, and I am much indebted to that esteemed lepidopterist for the loan of what I believe is at present an unique specimen.

## Genus MATAPA.

*Matapa*, Moore, Lep. Ceyl. vol. i. p. 163 (1881).

This genus is most readily recognised by the position of the cell to the anterior wings, which is attenuated anteriorly.

The male is described by Mr. Moore as having "an oblique discal slender linear glandular streak of raised scales" to the anterior wings.

\* What would old Isaac Walton have thought now, if possessed of the same spirit of admiration as when he wrote, more than two hundred years ago, "Nay, the Royal Society have found and published lately that there be thirty and three kinds of spiders; and yet all, for aught I know, go under that one general name of spider."

1. *Matapa aria*. (Tab. XXXV., fig. 8.)

*Ismene Aria*, Moore, Proc. Zool. Soc. 1865, p. 784; Wood-Mas. & de Nic. J. A. S. Beng. xlix. p. 241, n. 75 (1880).

*Pamphila Aria*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 554, n. 1 (1877).

*Hesperia Aria*, Plötz, Stett. Ent. Zeit. xliii. p. 315, n. 4 (1882).

*Matapa Aria*, Moore, Lep. Ceyl. vol. i. p. 164, t. 66, f. 1, 1a (1881).

The figure is taken from a Malaccan specimen in the British Museum, and the following is Mr. Moore's original description:—

“*Male and female* chocolate-brown.

“*Male*. Upperside pale brown; fore wing with a short impressed comma-like grey streak obliquely beneath the cell. Cilia yellowish white. Underside bright ferruginous-brown. Palpi ferruginous-brown.”

“*Female*. Upperside dark chocolate-brown, without the impressed streak; cilia of hind wing pale orange-yellow. Underside bright ferruginous-brown.”

Exp. wings, “♂  $1\frac{6}{8}$ , ♀  $2\frac{1}{8}$  inches.”

HAB.—Continental India; Bengal (Moore).—Ceylon (Thwaites—coll. Dist.).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Java (Horsf.).

Several accounts of the habits of this species have been given by observers in Ceylon. At Colombo Capt. Hutchison found it in “Plains and forest. During S.W. Monsoon. Settles on leaves.” At Kandy Capt. Wade-Dalton reports it as “Uncommon. Found in Guinea-grass”; whilst Mr. Mackwood states that it “appears twice a year generally—in January and July; at other times very scarce.”\*

## Genus PITHAURIA.

*Pithauria*, Moore, Proc. Zool. Soc. 1878, p. 689.

This genus has the upper disco-cellular nervule of the anterior wings longer than the lower disco-cellular, thus differing from *Matapa*, whilst from *Zea*, with which it agrees in that respect, it is differentiated by the position of the median nervules of the anterior wings, of which the second has its base less than twice as far apart from that of the lower as from that of the upper median nervule.

In his description of this genus Mr. Moore does not describe the neururation, but only states “venation similar to *Pamphila*.” It is evident that at that time Mr. Moore had not recognised the true genus *Pamphila*, and therefore these remarks are incorrect. The genus, however, is fixed by its type, which is here described.

1. *Pithauria murdava*. (Tab. XXXV., fig. 9 ♂.)

*Ismene murdava*, Moore, Proc. Zool. Soc. 1865, p. 784; Druce, Proc. Zool. Soc. 1873, p. 359, n. 7.

*Pithauria murdava*, Moore, Proc. Zool. Soc. 1878, p. 689, t. xlv. f. 13.

Male. Wings above olivaceous-brown; anterior wings with the base greyish, and with six small pale ochraceous discal spots, situate two in cell, two beyond cell separated by the fifth subcostal nervule, and two beneath cell separated by the second median nervule; posterior wings greyish, with the margins broadly olivaceous-brown. Wings beneath brownish-ochraceous; anterior wings with the disk blackish, and spotted more or less as above; posterior wings with indistinct ochraceous discal and submarginal

\* Moore's Lep. Ceyl. vol. i. p. 164.



markings. Body above olivaceous-brown; abdomen above with segmental ochraceous fasciæ; body beneath and legs more or less ochraceous.

Female. Differing from the male by having the greyish markings above much darker in hue, and the abdomen above without the pale segmental fasciæ.

Exp. wings, ♂ & ♀, 40 to 42 millim.

HAB.—Continental India; Darjeeling (Moore and coll. Dist.).—Malay Peninsula; Singapore (coll. Godfery).—Borneo (Druce).

The only specimen known to the writer from the Malay Peninsula is the one here figured, which was captured at Singapore by Capt. Godfery.

### Genus BAORIS.

*Baoris*, Moore, Lep. Ceyl. vol. i. p. 165 (1881).

*Parnara*, Moore, Lep. Ceyl. vol. i. p. 166 (1881).

*Chapra*, Moore, Lep. Ceyl. vol. i. p. 169 (1881).

In this genus the upper disco-cellular nervule of the anterior wings is longer than the lower, thus agreeing with *Pithauria*, but it differs from that genus by the position of the median nervules of the anterior wings, of which the second has its base about twice as far apart from the lower as from the upper median nervule, thus resembling *Zea*, from which, however, it is distinguished by the very oblique position of the upper median nervule.

I have failed to discover the characters which separate the above-named three proposed genera of Mr. Moore, no diagnosis of the neuration having been given in either case, save that *Parnara* has similar venation to *Chapra*. Glandular tufts have been used for the separation of *Baoris* and *Chapra*, but these alone have not been considered as primary generic characters in this work.

It is probable that this genus has a wide Ethiopian as well as Oriental distribution, but the classified material is too scanty as yet to warrant very definite conclusions on that point.

#### 1. *Baoris moolata*. (Tab. XXXIV., fig. 10 ♂.)

*Hesperia moolata*, Moore, Proc. Zool. Soc. 1878, p. 843.

*Pamphila julianus*, Butl. (nec. Latr.), Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 554, n. 2 (1877).

Male. Wings above dark vinous-brown, the fringe greyish-ochraceous; anterior wings with the following very pale ochraceous spots:—one in and near end of cell, two or three—small—beyond cell and before apex, and three placed obliquely, divided by the first and second median nervules, and of which the lowermost is much the largest and is subquadrate in form. Wings beneath as above.

Female. Resembling the male, but having two spots in and near end of cell and an additional spot placed between the lower median nervule and the submedian nervure. Wings beneath lighter and brighter in hue than above.

Exp. wings, ♂ and ♀, 36 to 39 millim.

HAB.—Tenasserim; Ahsown, Moolai to Moolat (Limborg—Moore).—Malay Peninsula; Penang (coll. Dist.); Perak (Townsend—coll. Godm. & Salv.); Malacca (Pinwill—Brit. Mus.).—Borneo; Sandakan (Pryer—coll. Dist.).

2. *Baoris narooa*. (Tab. XXXIV., fig. 12 ♀.)

*Hesperia narooa*, Moore, Proc. Zool. Soc. 1878, p. 687; Wood-Mas. & de Nic. J. A. S. Beng. vol. L. p. 260, n. 125 (1881).

*Parnara narooa*, Moore, Lep. Ceyl. vol. i. p. 167, t. 69, f. 3, a, b (1881); De Nic. J. A. S. Beng. vol. lii. p. 99, n. 264 (1883).

Male and Female. Wings above vinous-brown, the basal areas paler, fringe pale brownish-grey. Anterior wings with the following very pale ochraceous spots:—two in and near end of cell, three—small—in almost upright series beyond cell and divided by the fourth and fifth subcostal nervules, five in oblique discal series, of which the fourth is exceedingly minute and placed beneath the lower median nervule (omitted in the figure here given); posterior wings with two very small pale discal spots—three in female. Wings beneath paler than above; anterior wings spotted as above; posterior wings with a small pale spot at upper end of cell, and a discal series of four small pale spots. Body above concolorous with wings; palpi, anterior portion of sternum, and abdomen beneath, greyish-brown.

Exp. wings, ♂ & ♀, 40 to 48 millim.

HAB.—Continental India; Bombay (Moore); Sikkim (de Nic.).—Ceylon (Thwaites—coll. Dist.).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Malay Peninsula; Province Wellesley (coll. Dist.).

This species seems closely allied to the *Gegenes contigua* and *G. javana* of Mabille, both described as from Java,\* and principally differs from the description of those species by the number of the discal spots on the under surface of the posterior wings.

3. *Baoris chaya*. (Tab. XXXIV., fig. 9.)

*Hesperia Chaya*, Moore, Proc. Zool. Soc. 1865, p. 791; Wood-Mas. & de Nic. J. A. S. Beng. vol. xlix. p. 242, n. 85 (1880); de Nic. J. A. S. Beng. vol. L. p. 60, n. 124 (1881).

*Pamphila Chaya*, Mab. Ann. Soc. Ent. Belg. xxi. p. 37, n. 134 (1878).

Wings above vinous-brown, the fringe greyish-brown; anterior wings with the following pale ochraceous spots:—a duplex spot within cell, two—small—beyond cell and separated by the lower subcostal nervule, and an oblique discal series of four spots placed between the nervules, of which the first and fourth are smallest; posterior wings with some very obscure pale discal spots. Wings beneath paler and more rufous-brown; anterior wings spotted as above; posterior wings with a few small and very pale discal spots. Body above more or less concolorous with wings; palpi and abdomen beneath greyish-brown.

Exp. wings, 32 to 35 millim.

HAB.—Continental India; Bengal (Moore); Sikkim (de Nic.).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Malacca (coll. Staud.; Biggs—coll. Dist.); Singapore (Wallace—coll. Godm. & Salv.).—Java (Horsf. & Moore).

According to Mr. de Nicéville, “this is the widest spread and commonest *Hesperia* in North India, met with everywhere from the plains to 8000 feet elevation.” †

4. *Baoris mathias*. (Tab. XXXV., fig. 10.)

*Hesperia Mathias*, Fabricius, Ent. Syst. Suppl. p. 433 (1798); Latr. Enc. Méth. ix. p. 751, n. 61 (1823); Moore, Proc. Zool. Soc. 1877, p. 594; Wood-Mas. & de Nic. J. A. S. Beng. vol. L. p. 238, n. 61 (1881).

*Epargyreus Mathias*, Butl. Cat. Fabr. Lepid. p. 275, n. 1, t. 111, f. 8 (1869).

\* Bull. Soc. Zool. Fr. 1877, p. 232, note.

† J. A. S. Beng. vol. L. p. 60 (1881).

*Pamphila Mathias*, Butl. Proc. Zool. Soc. 1870, p. 728, n. 1; *ibid.* 1881, p. 612, n. 50; Druce, Proc. Zool. Soc. 1874, p. 109, n. 1; Snell. Tijl. Ent. xix. p. 158, n. 76 (1876); Mab. Ann. Soc. Ent. Belg. xxi. p. 37, n. 133 (1878); Moore, Proc. Zool. Soc. 1878, p. 843; Wood-Mas. & de Nic. J. A. S. Beng. vol. L. p. 261, n. 129 (1881); Kheil, Rhop. der Insel. Nias, p. 38, n. 146 (1884).

*Pamphila Matthias*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 554, n. 3 (1877); Proc. Zool. Soc. 1877, p. 815, n. 40.

*Chapra Mathias*, Moore, Lep. Ceyl. vol. i. p. 169, t. 70, f. 1, 1a (1881); Proc. Zool. Soc. 1882, p. 261; de Nic. J. A. S. Beng. vol. lii. p. 99, n. 269 (1883); Butl. Proc. Zool. Soc. 1883, p. 154, n. 32.

*Parnara Mathias*, Butl. Proc. Zool. Soc. 1884, p. 493, n. 39.

Wings above vinous-brown, the fringe greyish; anterior wings with eight small greyish spots, situate two in cell, three in suberect and subapical series beyond cell, and three in oblique series—of which the uppermost is smallest—divided by the first and second median nervules; between the lowermost spot and the submedian nervure is a narrow, transverse linear, greyish impression. Wings beneath paler than above; anterior wings spotted as above, but the spots a little darker in hue; posterior wings with a small pale spot in cell, and a curved discal series of small pale spots situate between the costal nervure and the lower median nervule. Body above more or less concolorous with wings; palpi and abdomen beneath greyish.

Exp. wings, 31 to 33 millim.

HAB.—Aden (Butl.).—Continental India; Karachi (Swinhoe—Brit. Mus.); N.W. Himalaya (Hocking—Moore); Gujerat (Spaight—Brit. Mus.); Sikkim (de Nic.).—Ceylon (Moore).—Nicobar Islands; Kamorta (Moore).—Burma; Moulmein (Limborg—Moore).—Tenasserim; Meetan (Limborg—Moore).—Malay Peninsula; Malacca (coll. Staud; Pinwill—Brit. Mus.); Singapore (coll. Godfery).—Siam; Nahconchaisee (Druce).—Nias Island (Kheil).—Java; Batavia (Snell.).—Formosa (Butl.).

This widely spread species appears to have been somewhat neglected by collectors in the Malay Peninsula, as beyond the specimens collected by Capt. Pinwill in Malacca and now contained in the British Museum, the example captured in Singapore by Capt. Godfery—here figured—has alone passed through my hands. It also appears to have passed through many generic vicissitudes, Mr. Butler, as the above quotations testify, having already placed it in four different genera.

##### 5. *Baoris unicolor*. (Tab. XXXV., fig. 11.)

Wings above and beneath unicolorous rufous-brown; body dark brown; legs pale brown.

Exp. wings, 30 millim.

HAB.—Malacca (coll. Staud.).

This obscure, and to me unique, *Baoris* is contained in the collection of Dr. Staudinger, to whom I am indebted for the opportunity of figuring and describing it in this work.

#### Genus TELICOTA.

*Telicota*, Moore, Lep. Ceyl. vol. i. p. 169 (1881).

*Padraona*, Moore, Lep. Ceyl. vol. i. p. 170 (1881).

*Ampittia*, Moore, Lep. Ceyl. vol. i. p. 171 (1881).

In *Telicota* the upper disco-cellular nervule of the anterior wings is longer than the lower, thus agreeing with the preceding genera *Pirdana*, *Pithauria*, *Zea*, and *Baoris*, but from these genera it differs by the position of the second median nervule of the anterior wings, which has its base either midway between that of the upper and lower median nervules, or rather nearer to the lower than to the upper.

1. *Telicota augias*. (Tab. XXXIV., fig. 23).

*Papilio Augias*, Linnæus, Syst. Nat. i. 2, p. 794, n. 257 (1767); Joh. Amoen. Acad. vi. p. 410, n. 80 (1764);  
Don. Ins. Ind. t. 48, f. 1 (1800).

*Hesperia Augias*, Latr. Enc. Méth. ix. p. 767, n. 111 (1823).

*Pamphila Augias*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 251, n. 566 (1857); Moore, Proc. Zool. Soc. 1865, p. 792; Druce, Proc. Zool. Soc. 1874, p. 109, n. 2; Butl. Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 248, n. 32 (1876); Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 554, n. 4 (1877); Snell. Tijd. Ent. xix. p. 158, n. 77 (1876); ibid. xx. p. 3 (1877); ibid. xxi. p. 41, n. 172 (1878); Mab. Ann. Soc. Ent. Belg. xxi. p. 37, n. 138 (1878); Salv. & Godm. Proc. Zool. Soc. 1877, p. 149, n. 40; Wood-Mas. & de Nic. J. A. S. Beng. vol. L. p. 261, n. 133 (1881); de Nic. J. A. S. Beng. vol. L. p. 60, n. 121 (1881).

Wings above dark ochraceous; anterior wings with the neuration, a broad oblique discal fascia,—commencing at end of cell where it is broadest and ending at submedian nervure,—and a series of outer marginal more or less elongate spots placed between the nervules,—of which the two uppermost are longest and the third and fourth shortest,—black; the discal fascia has its central area paler in hue; posterior wings with the costal and basal areas,—excluding cell,—a broad scalloped outer marginal fascia widening towards anal angle, abdominal area and the neuration black; fringe of both wings greyish ochraceous. Anterior wings beneath as above, but the black discal fascia shorter, and the outer marginal spots more or less obsolete; posterior wings beneath with only traces of the black markings above. Body above fuscous, beneath greyish-ochraceous; legs dark ochraceous.

Exp. wings, 30 to 33 millim.

HAB.—Continental India; Bengal (Moore); Sikkim (de Nic.).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Malay Peninsula; Province Wellesley (coll. Dist.); Malacca (coll. Staud.; Pinwill—Brit. Mus.; Biggs—coll. Dist.).—Siam; Nahconchaisee (Druce).—Sumatra (Forbes—coll. Dist.).—Java (Horsf.); Batavia (Snell.).—New Guinea; Port Moresby (Brit. Mus.).—Duke of York Island (Salv. & Godm.).

2. *Telicota bambusæ*. (Tab. XXXV., fig. 12.)

*Pamphila bambusæ*, Moore, Proc. Zool. Soc. 1878, p. 691, t. xlv. f. 11 & 12.

Mr. Moore thus diagnoses his species:—"Allied to *P. augias*, Linn., from typical Java specimens of which it differs in its somewhat broader and less pointed wings. Markings above similar, but more defined, the borders of the wings blacker, the basal yellow streak on hind wing confined to a terminal spot at the end of the cell, and the abdominal border black. On the underside the markings are also more clearly defined and the interspaces blacker."

Exp. wings, "♂  $1\frac{3}{8}$ , ♀  $1\frac{1}{8}$  inch."

HAB.—Continental India; Calcutta (Frith & Atkinson—colls. Moore & Staud.).—Malay Peninsula; Johore (coll. Staud.).

According to Dr. Atkinson, the larva of this species "feeds on the bamboo."\*

The figure is taken from a specimen captured at Johore, and contained in the collection of Dr. Staudinger.

3. *Telicota goloides*. (Tab. XXXV., fig. 13 ♂.)

*Padraona goloides*, Moore, Lep. Ceyl. vol. i. p. 171, t. 71, f. 3, 3a (1881).

*Pamphila naranata*, Moore, MS.; (Horsf. & Moore), Cat. Lep. Mus. E. I. C. vol. i. p. 251, n. 565 (1857).

Male. Anterior wings above dark ochraceous, the outer margin broadly dark chocolate-brown, and with an irregular oblique discal fascia of the same colour, which commences at costa,—where it is united

\* Proc. Zool. Soc. 1878, p. 691.

with the outer margin,—is widest and elongately produced beyond cell, and is continued through cell to base; this fascia encloses a small ochraceous spot at upper end of cell; posterior wings above dark chocolate-brown, with a transverse discal ochraceous fascia; fringe of both wings greyish-ochraceous. Wings beneath with the dark markings more or less obsolete; anterior wings with the outer margin only dark chocolate-brown towards outer angle, the discal fascia obsolete, represented by a dark disco-cellular spot at end of cell, the inner margin and basal area also of the same colour; posterior wings much paler than above, the discal fascia more or less margined with dark spots. Body above dark chocolate-brown, beneath with legs more or less dark greyish-ochraceous.

Exp. wings, 24 to 27 millim.

HAB.—Ceylon (Thwaites—coll. Dist.).—Malay Peninsula; Singapore (coll. Stand.).—Java (Horsf.).

This is the species which stands in Horsfield and Moore's Catalogue under the MS. name of *Pamphila naranata*, as I have satisfied myself by a careful comparison with the specimen thus named in the Horsfield collection. It has since been described under the name of *Padraona goloides* by Mr. Moore. My Ceylonese specimens are identical with the Singapore example here figured, which belongs to the collection of Dr. Standinger.

In Ceylon, according to Mr. Mackwood, this species "is widely distributed. Sea coast up to 5000 feet. Generally January to March."\*

#### 4. *Telicota mæsoides*. (Tab. XXXIV., fig. 24.)

*Pamphila mæsoides*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 554, n. 5 (1877); Moore, Proc. Zool. Soc. 1877, p. 594; Wood-Mas. & de Nic. J. A. S. Beng. vol. xlix. p. 242, n. 87 (1880).

*Padraona mæsoides*, Moore, Lep. Ceyl. vol. i. p. 171 t. 71, f. 5, 5a (1881).

Wings above dark ochraceous; anterior wings with the outer margin broadly dark chocolate-brown, and with an oblique discal fascia of the same colour, commencing at costa, deflected outwardly at end of cell—sometimes connected with outer margin—and continued broadly beneath cell to base; posterior wings dark chocolate-brown, with a transverse discal fascia, a spot in cell and a subcostal spot dark ochraceous; fringe of both wings greyish-ochraceous. Wings beneath as above, but much paler. Body above dark chocolate-brown, beneath with legs more or less greyish-ochraceous.

Exp. wings, 20 to 25 millim.

HAB.—Ceylon (Thwaites—coll. Dist.).—Andaman Islands; Port Blair (coll. Moore & Calc. Mus.).—Malay Peninsula; Perak (Townsend—coll. Godm. & Salv.); Malacca (coll. Staud.; Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (Kerr—coll. Dist.).—Java; Bantam (coll. Dist.).

This seems a widely distributed species, and from *T. goloides* may be readily distinguished by the very different markings of the under surface of the wings.

#### 5. *Telicota maro*. (Tab. XXXV., fig. 14 ♂, 15 ♀.)

*Hesperia Maro*, Fabricius, Ent. Syst. Suppl. p. 432, n. 242, 243 (1798).

*Cyclopides Maro*, Butl. Cat. Fabr. Lep. p. 279, t. 11, f. 12 (1869).

*Cyclopides Camertes*, Hew. Descr. Hesp. p. 43, n. 8 (1868).

*Pamphila Maro*, Druce, Proc. Zool. Soc. 1874, p. 109, n. 3; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 6 (1877); Snell. Tijd. Ent. xxi. p. 41, n. 171 (1878); Mab. Ann. Soc. Ent. Belg. xxi. p. 38, n. 146 (1878).

*Ampittia Maro*, Moore, Lep. Ceyl. vol. i. p. 172, t. 71, f. 1, 1a (1881); Proc. Zool. Soc. 1882, p. 262.

\* Moore's Lep. Ceyl. vol. i. p. 171.

Male. Anterior wings above dark ochraceous, outer margin broadly chocolate-brown and a discal narrow transverse fascia of the same colour commencing at costa and united to outer margin beyond cell, and connected from lower median nervule with inner margin, where it there encloses a small ochraceous spot; posterior wings above dark chocolate-brown, with a short but broad transverse discal ochraceous fascia; fringe of both wings greyish-ochraceous, spotted with brownish. Anterior wings beneath as above, but paler and with the outer dark margin broken; posterior wings beneath ochraceous, with dark, waved and somewhat reticulated narrow fasciæ, and with a submarginal series of dark spots. Body above dark chocolate-brown, beneath with legs more or less greyish-ochraceous.

Female. Wings above dark brown, the pale markings of the male only represented by a few scattered pale spots; wings beneath much paler than in male, and with the darker markings larger.

Exp. wings, ♂, 21 to 23 millim.; ♀, 21 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—Moore).—Ceylon (Thwaites—coll. Dist.).—Malay Peninsula; Malacca (Pinwill—Brit. Mus.); Singapore (colls. Hewits. & Godfery).—Siam; Nahconchaisee (Druce).—Java (Mabille).—Celebes (Snell.).

This species has been redescribed by the late Mr. Hewitson under the name of *Cyclopides Camertes*. The female is peculiar by its diverse appearance, a specimen of which, belonging to the collection of Capt. Godfery, is here figured.

#### 6. *Telicota nigrolimbata*. (Tab. XXXV., fig. 16.)

*Thymelicus nigrolimbatus*, Snellen, Tijds. Ent. xix. p. 165, t. 7, f. 5 (1876); Kheil, Rhop. der Insel. Nias, p. 38, n. 147 (1884); Plötz, Stett. Ent. Zeit. xlv. p. 289, n. 19 (1884).

*Pamphila nigrolimbata*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 7 (1877).

This species—not contained in the writer's collection—differs from the preceding species here enumerated and described, in the apparently broken and more or less obsolete discal fascia on the upper surface of the anterior wings; the lower wings above somewhat resemble those of *T. mæsoides*. Wings beneath generally resembling their upper surface.

Exp. wings, "19 to 23 millim."

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Nias Island (Kheil).—Java; Batavia (Snellen).

The figure here given represents a capture made by Capt. Pinwill in Malacca, and now contained in the British Museum. It has not been included in any of the numerous collections which have passed under the writer's examination.

#### Genus SATARUPA.

*Satarupa*, Moore, Proc. Zool. Soc. 1865, p. 780.

The first distinguishing feature between *Satarupa* and the preceding genera is that of the regular outer margin of the posterior wings, which is neither sinuated nor lobately produced at anal angle. The base of the second median nervule of the anterior wings is about, or little more than, twice as far apart from that of the lower as from that of the upper median nervule. The antennæ have their apices strongly hooked or curved.

This genus is somewhat scarcely represented in most collections, and its area of distribution cannot be rigidly defined owing to our little knowledge of its species. It is represented in Continental India by several species, and one has been described from Borneo.

1. *Satarupa affinis* var. *cognata*. (Tab. XXXV., fig. 17.)

*Satarupa affinis*, Druce, Proc. Zool. Soc. 1873, p. 360, n. 1, t. xxxiii. f. 9.

Wings above dark fuscous; anterior wings with seven or eight small pale and semihyaline spots, situate two beneath cell divided by the lower median nervule (the lowermost sometimes duplex), two beyond cell divided by the upper median nervule, two separated by the upper discoidal nervule, and one on each side of the fourth subcostal nervule; posterior wings with a broad white central discal fascia, commencing near costa and terminating at abdominal margin, its outer margin fringed with a series of blackish spots just contained in the outer fuscous area; fringe alternately greyish-white. Anterior wings beneath as above, but paler; posterior wings as above, but the white area larger, the basal fuscous coloration above replaced by greenish-grey beneath, the black spots beneath more or less detached from the outer fuscous coloration. Body above dark fuscous, beneath with legs greyish; palpi greyish, with their apices fuscous.

Exp. wings, 40 millim.

HAB.—Malay Peninsula; Perak (Künst.—Calc. Mus.); Malacca (coll. Staud.).

This may probably prove to be a distinct species, but I have been unable to find any very strong character to separate it from the type of Mr. Druce's Bornean species, which I have carefully examined, and which is now in the collection of Messrs. Godman and Salvin. Its chief difference is in the position of the black spots in the outer fuscous area of the posterior wings, and these in typical *S. affinis* are more immersed in that fuscous area than in var. *cognata*. On the under surface of the wings this area is also much more broken and obsolete than in the variety? here described and figured.

## Genus CASYAPA.

*Casyapa*, Kirby, Syn. Cat. Diurn. Lep. p. 576 (1871).

*Chatocneme*,\* Feld. Sitzb. Ak. Wiss. Math. Nat. Cl. xl. p. 460 (1860).

In this genus the anterior wings are relatively somewhat shorter and broader than in the preceding genera, the costal margin is slightly falcate at apex, the outer margin nearly straight; the upper discocellular nervule is shorter than the lower, which is obliquely directed inwardly, and the base of the second median nervule is a little more than twice as far apart from that of the lower as from that of the upper median nervule. The posterior wings are subovate, the first and second median nervules having an apparently common origin at about end of cell. The body is robust and hairy, the palpi broad, thickly clothed with somewhat short hairs and directed upwards and forwards; the antennæ are of moderate length, with a well-thickened curved club, which is not so strongly hooked as in *Satarupa*; the posterior tibiæ are very prominently spined and clothed with very long hairs.

This genus has sometimes had an indiscriminate application, and without a thorough examination of many species—some not attainable to the writer—it is impossible to speak of its geographical distribution. The typical species on which the genus was founded is from Amboina, and *Casyapa* is probably widely distributed throughout the Malayan Archipelago.

One species only is known to the writer as found in the Malay Peninsula.

\* This name was preoccupied by *Chatocnema* in Coleoptera, and therefore the genus was rightly renamed by Mr. Kirby.

1. *Casyapa phanæus*. (Tab. XXXV., fig. 18.)

*Eudamus Phanæus*, Hewitson, Deser. Hesp. p. 14, n. 24 (1867).

Wings above rufous-brown. Anterior wings with three large pale discal semihyaline spots margined with fuscous, situate one in and at end of cell, and two beneath cell divided by the second median nervule; beneath these are two fuscous spots situate between the lower median nervule and the submedian nervule; three subapical fuscous spots with greyish centres divided by the fourth and fifth subcostal nervules. Posterior wings with a single discal and a series of submarginal fuscous spots; abdominal margin more or less ochraceous. Wings beneath somewhat duller and paler in hue than above; markings similar. Body and legs more or less concolorous with wings.

Exp. wings, 55 millim.

HAB.—Malay Peninsula; Singapore (Wallace—coll. Godm. & Salv.).—Borneo; Sarawak (Hewitson).

## Genus ISMA.

*Isma*, Distant, *antea*, p. 369.

In this genus the anterior wings are elongate, the outer margin oblique and slightly convex; the disco-cellular nervules are obliquely directed inwardly, and the base of the second median nervule is about three times as far apart from that of the lower as from that of the upper median nervule. The body is robust and pilose, the palpi broad and hairy, projecting forward and almost level with the upper surface of the head; antennæ with a pyriform club, the apex of which is slender and slightly hooked.

Two species are here enumerated as found in the Malay Peninsula.

1. *Isma obscura*. *n. sp.* (Tab. XXXV., fig. 19.)

Wings above dark fuscous; anterior wings with five greyish spots, situate two—small—in and before end of cell, two—largest—beneath cell and divided by the second median nervule, and one between end of cell and apex of wing. Wings beneath paler than above; anterior wings spotted as above, and with the inner marginal area greyish; posterior wings with the abdominal area paler. Head and thorax above more or less greyish; legs brownish. *Abdomen mutilated*.

Exp. wings, 33 millim.

HAB.—Malay Peninsula; Singapore (Wallace—coll. Godm. & Salv.).

2. *Isma bononia*. (Tab. XXXV., fig. 20.)

*Hesperia Bononia*, Hewitson, Deser. Hesp. p. 29, n. 16 (1868); Ex. Butt. v. Hesp. t. 7, f. 75, 76 (1876).

This species is only known to the writer by the typical specimen (which is here figured) in the collection of the late Mr. Hewitson, whose original description is also reproduced:—

“Upperside dark brown. Anterior wing with five transparent spots:—three between the median nervures and two before the apex: an opaque pale-yellow spot near the costal margin. Posterior wing with two transparent spots.”

“Underside ochreous-yellow; the middle of the anterior wing dark brown. Posterior wing with the transparent spots bordered below with brown, and with a brown spot on each side of them.”

Exp. wings, “ $1\frac{1}{8}$  inch.”

HAB.—Malay Peninsula; Singapore (Wallace—coll. Hewitson).



## Genus TAGIADES.

*Tagiades*, Hübner, Verz. bek. Schmett. p. 108 (1816); Moore, Lep. Ceyl. vol. i. p. 175 (1881).

*Pterygospidea*, Wallengr. Rhop. Caffr. p. 53 (1857).

Anterior wings moderately short, the costal and outer margins slightly convex. Costal nervure moderately swollen; disco-cellular nervules suberect and almost subequal in length; base of the second median nervule about three times as far apart from that of the lower as from that of the upper median nervule. Posterior wings subovate. First and second median nervules emitted somewhat close together. Body short; palpi broad and flattened, the terminal joint short and slender; legs not prominently pilose; antennæ somewhat short, the club not prominently thickened, its apex recurved, but not strongly hooked.

This genus is both Ethiopian and Oriental in distribution, and the species appears to be subject to considerable variation.

1. *Tagiades atticus* var. *calligana*. (Tab. XXXIV., fig. 6.)

*Hesperia Atticus*, Fabricius, Ent. Syst. iii. 1, p. 339, n. 288 (1793).

*Tagiades calligana*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 556, n. 3, t. lxix. f. 11 (1877).

*Var. a.* Anterior wings dark fuscous, with a subapical series of nine small pale ochraceous spots arranged in semicircular series; posterior wings greyish-white, with about basal half and apex dark fuscous, and three submarginal black spots, the uppermost more or less fused with apical coloration, and lowermost situate on second median nervule. Anterior wings beneath as above, but slightly paler; posterior wings beneath greyish-white, the costal and apical margins broadly fuscous, and with a submarginal series of darker spots, which become marginal and more or less fused on posterior margin; the basal dark coloration above appearing as pale obscure bluish beneath. Body above dark fuscous, beneath more or less greyish.

Exp. wings, 35 milim.

HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.); Malacca (Wallace—coll. Godm. & Salv.; Pinwill—Brit. Mus.; Biggs—coll. Dist.).

This is the variety figured, and which appears to differ from typical *T. atticus* in wanting a lower marginal spot to the upper surface of the posterior wings.

*T. atticus* in its typical form is found both in Continental India and Ceylon.

*Var. b.* Differing from *var. a* in having the basal fuscous coloration to the upper surface of the posterior wings larger, and extending more than half way across the wing; and with four dark marginal spots as in typical *T. atticus*.

HAB.—Malay Peninsula; Malacca (coll. Standing).

There can be little doubt that *T. atticus* is a most variable species, and little good can accrue to our knowledge by raising these varieties to specific rank. It is difficult to understand the position of those entomologists who, professing to believe in the doctrine of natural selection, yet tacitly deny variation on which that very doctrine is sustained, by naming and describing each varietal form as a distinct species. If variation exists, why is it excluded from so many cabinet drawers? Surely this is making evolutionary brick without natural straw.

2. *Tagiades gana*. (Tab. XXXIV., fig. 2 ♂.)

*Pterygospidea Gana*, Moore, Proc. Zool. Soc. 1865, p. 780.

*Tagiades gana*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 556, n. 2 (1877).

Male. Wings above dark fuscous; anterior wings with three small greyish semihyaline subapical spots, and a transverse discal macular fascia, a large spot within the cell, another near base, and the exterior margin blackish; posterior wings with about the outer third greyish-white; apical margin, three upper discal spots, and two marginal spots on the greyish-white area, blackish. Anterior wings beneath as above, but paler; posterior wings beneath greyish-white, the costal and apical margins broadly fuscous; spots as above, but the marginal ones frequently larger and more spreading, and the basal fuscous coloration above, pale and obscure bluish beneath. Body above concolorous with wings, beneath greyish.

Female. Wings above paler than in male, and the greyish-white area to the upper surface of the posterior wings much smaller than in the other sex.

Exp. wings, ♂, 43 to 45 millim.; ♀, 45 millim.

HAB.—Continental India; Bengal (Moore).—Malay Peninsula; Penang (Biggs—coll. Dist.; Wallace—coll. Godm. & Salv.); Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.).

3. *Tagiades ravi*. (Tab. XXXIV., fig. 1 ♂.)

*Pterygospidea Ravi*, Moore, Proc. Zool. Soc. 1865, p. 779.

*Tagiades Ravi*, Druce, Proc. Zool. Soc. 1874, p. 109, n. 2; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 556, n. 1 (1877); Wood-Mas. & de Nic. J. A. S. Beng. vol. xlix. p. 241, n. 78 (1880); *ibid.* vol. l. p. 238, n. 60 (1881).

Male. Wings above fuliginous-brown; anterior wings with three small greyish semihyaline subapical spots, two somewhat larger spots of the same colour beneath and beyond extremity of cell, three obscure blackish spots in transverse series across disk, one of the same colour in cell and another near base, apex and exterior margin darker; posterior wings with curved discal series of small blackish spots. Anterior wings beneath paler brown, with the semihyaline spots as above; posterior wings beneath olivaceous-grey, the costal and outer margins brown, and with curved discal series of small blackish spots—these are sometimes almost obsolete. Body above concolorous with wings, beneath more or less olivaceous-grey.

Female. Resembling the male, but with two minute additional semihyaline subapical spots, and with the blackish discal spots rather larger and brighter.

Exp. wings, ♂ & ♀, 40 to 48 millim.

HAB.—Continental India; Bengal (Moore).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Nicobar Islands; Nankowri (Wood-Mas. & de Nic.).—Malay Peninsula; Penang (Biggs—coll. Dist.); Province Wellesley (coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Wallace—coll. Godm. & Salv.).—Nias Island (coll. Dist.).—Siam (Druce).—Borneo; Sandakan (Pryer—coll. Dist.).

This species varies in the colour of the under surface of the posterior wings, which in some specimens is wholly pale fuliginous-brown, and in others more or less olivaceous-brown as in the specimen here figured.

4. *Tagiades dealbata*, *n. sp.* (Tab. XXXV., fig. 21.)

Wings above dark fuscous-brown; anterior wings with a cluster of small pale semihyaline spots, of which three or four are discal, and five in irregular series are subapical; posterior wings with the outer margin

from a little beneath apex to anal angle broadly greyish-white, a discal series of dark spots margining the upper end of this white area. Anterior wings beneath paler, spotted as above; posterior wings beneath with about the outer half irregularly greyish-white, the white area partly crossed by a series of small brown spots, and the basal brown area also variegated by somewhat large dark brown spots. Body and legs more or less concolorous with the dark hue of wings.

Exp. wings, 30 millim.

HAB.—Malay Peninsula: Sungei Ujong (Durnford—coll. Dist.); Malacca (coll. Staudinger).

5. *Tagiades lavata*. (Tab. XXXIV., fig. 5.)

*Tagiades lavata*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 557, n. 4, t. lxix. f. 8 (1877).

Wings above dark fuscous-brown; anterior wings with a few (irregular in number in different specimens) small pale semihyaline subapical spots; posterior wings with the outer margin from beneath apex to anal angle somewhat broadly greyish-white. Anterior wings beneath as above, but paler; posterior wings beneath greyish-white, with a pale bluish tinge, the costal margin and apex broadly fuscous. Body above dark fuscous, beneath greyish; legs more or less streaked with brownish.

Exp. wings, 32 millim.

HAB.—Malay Peninsula; Perak (coll. Dist.); Malacca (Pinwill—Brit. Mus.).

6. *Tagiades trichoneura*, var. (Tab. XXXIV., fig. 20.)

*Pterygospidea trichoneura*, Felder, Wien. Ent. Mon. iv. p. 402, n. 31 (1860); Reise Nov. Lep. iii. t. 73, f. 14, 15 (1867).

*Tagiades trichoneura*, Kheil, Rhop. der Insel Nias. p. 38, n. 149 (1881).

Wings above dark purplish-brown: anterior wings with the venation more or less greyish and with thirteen pale greyish spots, situate two in and two above cell, four in oblique series beneath cell, and five subapical (there is sometimes a small fourteenth subcostal spot as in the specimen figured). Posterior wings with the outer margin from the upper median nervule to anal angle broadly orange-yellow, and the same colour is extended narrowly for a short distance along the margin as far as the lower subcostal nervule, two elongate spots in cell, a discal series of elongate spots and the apical margin dark purplish. Anterior wings beneath as above, but with a few additional greyish spots; posterior wings beneath pearly-white, the costal and apical areas purplish-brown, containing a series of dark purplish elongate spots. Body above purplish-brown, the abdominal segments margined with greyish; body beneath with legs greyish.

Exp. wings, 33 to 42 millim.

HAB.—Malay Peninsula; Perak (Künst.—Cale. Mus.); Malacca (coll. Staud. & Feld.).—Nias Island (Kheil).—Java (Feld.).

Mr. Kirby\* has placed the *Pterygospidea Pralaya*, Moore, as a synonym of this species. It is, however, at least a distinct race, and appears to be confined to Continental India. In Mr. Moore's species the posterior wings are ochraceous, not pearly-white beneath. The width of the ochraceous margin to the posterior wings above is variable, as is the greyish margin of other species of the genus.

\* Syn. Cat. Diurn. Lep. p. 635-6.

## Genus ABARATHA.

*Abaratha*, Moore, Lep. Ceyl. vol. i. p. 181 (1881).

This genus differs from all those of the family which have been here previously enumerated by having the posterior wings with the outer margin angularly produced near apex.\* The anterior wings have the costal margin moderately arched, the outer margin obliquely rounded, the inner margin nearly straight. The first, second, third and fourth subcostal nervules are emitted at about equal distances apart, the fifth from upper end of cell, disco-cellular nervules obliquely directed inwardly, the lowermost the longest, second median nervule about twice as far apart from that of lower as from that of upper median nervule. Posterior wings irregularly subovate, the costal margin obliquely convex, the outer margin sinuate and angularly produced near apex and again more moderately so near centre; subcostal nervules bifurcating at about one-fourth before end of cell, first and second median nervules emitted somewhat close together near end of cell. Body moderately robust; palpi laterally compressed, terminal joint short and conical; posterior legs strongly pilose;† antennæ with a short and thick curved or hooked club.

The strength and geographical distribution of this genus cannot at present be fixed; one species is found in Ceylon, and two are at present recorded from the Malay Peninsula.

1. *Abaratha sura*. (Tab. XXXIV., fig. 16 ♂.)

*Achylodes Sura*, Moore, Proc. Zool. Soc. 1865, p. 786.

*Pterygospidea Helias*, Feld. Reise Nov. Lep. iii. p. 529, n. 926, t. 73, f. 12, 13 (1867).

Wings above dull purplish; anterior wings with an oblique blackish fascia (sometimes broken) crossing wing before middle, a waved submarginal blackish fascia, margined interiorly with two subapical white spots, and with two others divided by the second median nervule, these white spots margined with blackish; beyond the outermost fascia the colour is more or less bright castaneous; posterior wings with a sub-basal greyish oblique linear fascia, two subapical (the innermost very short) linear greyish fasciæ, and two submarginal series of greyish spots, the lowermost with dark centres *in the male*, a series of apical marginal blackish spots and the basal greyish fascia *in male* also inwardly margined with blackish. Anterior wings beneath much paler than above; posterior wings beneath greyish-white with a subcostal rounded blackish spot near base, and the spots above darker and better defined beneath. Body above more or less concolorous with wings, beneath with legs greyish.

Exp. wings, 35 to 40 millim.

HAB.—Continental India; Bengal (Moore); Darjeeling (Horsf. & Moore †).—Malay Peninsula; Perak (Künst.—Calc. Mus.; Townsend—coll. Godm. & Salv.); Malacca (Biggs—coll. Dist.).—Celebes (Felder).

2. *Abaratha pygela*. (Tab. XXXIV., fig. 18.)

*Pterygospidea Pygela*, Hewitson, Deser. Hesp. p. 53, n. 6 (1868) Ex. Butt. v. *Pter.* t. 1, f. 3 (1873).

*Antigonus pygela*, Druce, Proc. Zool. Soc. 1873, p. 360, n. 1.

Wings above chocolate-brown, extreme bases narrowly greyish; anterior wings with a transverse dark fascia margined with greyish near base, a waved irregular dark fascia inwardly more or less

\* Of course this is a superficial and not a true structural generic character, but it is of great use in distinguishing between the genera of a small fauna, as of the Malay Peninsula, and is simply used in the "Synopsis" for that purpose. The practice of founding genera upon shape of wing is even less followed than advocated.

† Mr. Moore describes the legs as naked, but I have specimens of the Ceylonese *A. ransonneti*, Feld., the type of his genus, in which the pilosity of the posterior legs is strongly developed.

‡ Cat. Lep. Mus. E. I. C. vol. i. p. 251 (1857).

margined with greyish situate near outer margin, and a submarginal narrow dark fascia; posterior wings with the abdominal margin, rather less than outer third of wing, a transverse sub-basal fascia, followed by a very irregularly waved linear fascia greyish-white; the outer white area traversed by two pale brownish fasciæ. Anterior wings beneath as above, but paler; posterior wings beneath greyish-white, the costal area spotted with brownish, and with some minute dark spots along outer margin. Body above chocolate-brown; apical half of abdomen more or less greyish; body beneath and legs greyish.

Exp. wings, 32 millim.

HAB.—Malay Peninsula; Perak (coll. Godfery; Künst.—Calc. Mus.); Malacca (Hewitson).—Borneo (Druce).

SPECIES INCERTÆ SEDIS.

I have here followed the method of Messrs. Godman and Salvin,\* in enumerating the following species without exact generic determination. The reason for such a course with myself is that the species are represented by single specimens, and are not in my own possession, so that complete study of neuration has been prevented by my responsibility to keep the specimens uninjured.

1. *Baoris? insignis*, *n. sp.* (Tab. XXXV., fig. 22.)

Wings above dark chocolate-brown; anterior wings with seven greyish-white discal spots, situate two subapical, two divided by second median nervule, two in cell, and one small and subcostal above them; posterior wings with the fringe prominently greyish-white; anterior wings beneath paler than above, spots similar, but with a faintly marked submarginal series of small pale spots; posterior wings beneath greyish-brown, the costal and basal areas brownish, and with a discal and marginal series of brownish spots, fringe as above. Body above concolorous with wings; body beneath with legs more or less greyish.

Exp. wings, 26 millim.

HAB.—Malay Peninsula; Singapore (coll. Godfery).

2. *Isma? homolea*. (Tab. XXXV., fig. 23.)

*Hesperia Homolea*, Hewitson, Deser. Hesp. p. 29, n. 15 (1868); Ex. Butt. V. Hesp. t. 7, f. 77, 78 (1876); Plötz, Stett. Ent. Zeit. xlv. p. 43, n. 312.

The figure is taken from the typical specimen in the late Mr. Hewitson's collection, and his description is here reproduced.

"Upperside dark brown. Anterior wing with five transparent spots; one in the cell, two between the median nervures, and two before the apex."

"Underside. Anterior wing with a submarginal band of ochreous spots. Posterior wing with two bands of similar spots and one spot more distinct than the rest towards the anal angle."

Exp. wings, "1 $\frac{3}{16}$  inch."

HAB.—Malay Peninsula; Singapore (Wallace—coll. Hewitson).

\* *Biologia Centrali Americana—Rhop.* vol. i. p. 486.

Group ERIONOTARIA.

This group—which was proposed (*antea*, p. 368) to include those genera whose species possessed posterior wings more or less convex and about as broad as long—is probably distributed wherever the family is found.

As already stated, this division is only proposed as a ready means of discrimination in the study of this fauna. I have not presumed to advocate it as of universal application, and in the words of Captain Cook, I do not wish, in this respect, “to go beyond soundings.”

SYNOPSIS OF GENERA.

- A. Outer and inner margins of anterior wings subequal in length.
  - a. Upper and lower disco-cellular nervules of anterior wings almost subequal in length.
    - b. Anterior wings elongated, about twice as long as broad.
      - c. Base of second median nervule of anterior wings about twice as far apart from that of lower as from that of upper median nervule.
        - d. Median nervure between bases of the two upper median nervules more or less oblique and curved. - - ERIONOTA.
        - dd. Median nervure between bases of the two upper median nervules straight. - - - - - GANGARA.
      - cc. Base of second median nervule of anterior wings about three times as far apart from that of lower as from that of upper median nervule.
        - e. First subcostal nervule of anterior wings emitted more nearly opposite the base of second than of lower median nervule. - - - - - PLASTINGIA.
        - cc. First subcostal nervule of anterior wings emitted more nearly opposite the base of lower than of second median nervule. - - - - - HYAROTIS.
    - bb. Anterior wings short, not twice as long as broad. - - COLADENIA.
  - aa. Upper disco-cellular nervule of anterior wing longer than lower.
    - f. Base of second median nervule of anterior wings not more than twice as far apart from that of lower as from that of upper median nervule. - - - - - HIDARI.\*
    - ff. Base of second median nervule of anterior wings more than twice as far apart from that of lower as from that of upper median nervule. - - - - - UDASPES.
- B. Inner margin of anterior wings longer than outer margin.
  - g. Base of second median nervule of anterior wings moderately close to that of upper and remote, or more than twice as far apart, from that of lower as from that of upper median nervule. - - - - - PLESIONEURA.
  - gg. Base of second median nervule of anterior wings about twice as far apart from that of lower as from that of upper median nervule.
    - h. First subcostal nervule of anterior wings emitted more nearly opposite the base of lower than of second median nervule. - - - - - ASTICTOPTERUS.
    - hh. First subcostal nervule of anterior wings emitted more nearly opposite the base of second than of lower median nervule. - - - - - KERANA. †



FIG. 118. — Anterior wing of *Erionota thrax*, showing median nervure.



FIG. 119. — Anterior wing of *Plastingia callineura*, showing position of subcostal and median nervules.



FIG. 120. — Anterior wing of *Hidari irava*, showing position of median nervules.



FIG. 121. — Anterior wing of *Kerana armata*, showing position of subcostal and median nervules.

\* Gen. nov., type *Hesperia Irava*, Moore.

† Gen. nov., type *Astictopterus armatus*, Druce.

## Genus ERIONOTA.

*Erionota*, Mabille, Ann. Soc. Ent. Belg. xxi. p. 34 (1878).

Anterior wings moderately long, the inner margin longer than the outer, costal margin very slightly sinuate, inner margin distinctly sinuate. Costal nervure terminating on costa nearly opposite end of cell; fifth subcostal nervule emitted at about end of cell; disco-cellular nervules moderately oblique, the upper and lower subequal in length; second median nervule with its base more than twice as far apart from that of lower as from that of upper median nervule. Posterior wings about as broad as long, the costal margin obliquely convex, the outer margin irregularly rounded and slightly sinuate towards anal angle. Subcostal nervules bifurcating at about half the distance before end of cell; second median nervule emitted at rather more than twice the distance from lower than from upper median nervule, which starts from end of cell. Body long, robust and pilose; palpi large, broad and considerably compressed, the terminal joint very short; antennæ slender, the apex moderately thickened and curved, not strongly hooked.

Mon. Mabille, the founder of this genus, included in it the *Hesperia irava*, Moore, but this species is structurally distinct, and is the type of my proposed genus *Hidari*.

1. *Erionota thrax*. (Tab. XXXIV., fig. 17.)

*Papilio Thrax*, Linnæus, Syst. Nat. i. 2, p. 794, n. 260 (1767); Don. Ins. Ind. t. 49, f. 2 (1800).

*Hesperia Thrax*, Latr. Enc. Méth. ix. p. 748, n. 53 (1823); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 254, n. 582 (1857); Moore, Proc. Zool. Soc. 1865, p. 790; Plötz, Stett. Ent. Zeit. xliii. p. 327 (1882).

*Casyapa Thrax*, Snell. Tijds. Ent. xix. p. 158, n. 73 (1876); *ibid.* xx. p. 3 (1877); *ibid.* xxi. p. 40, n. 161 (1878); *Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 1 (1877); Godm. & Salv. Proc. Zool. Soc. 1878, p. 641, n. 33; Elwes, Proc. Zool. Soc. 1881, p. 909; Kheil, Rhop. der Insel Nias, p. 38, n. 145 (1884).*

*Casyapa Thrax*, Druce, Proc. Zool. Soc. 1873, p. 358, n. 1.

*Erionota Thrax*, Mab. Ann. Soc. Ent. Belg. xxi. p. 35, n. 114 (1878).

*Telegonus Thrax*, De Nic. J. A. S. Beng. vol. li. p. 65, n. 196 (1882).

Male and Female. Wings above chocolate-brown; anterior wings with three discal pale ochraceous spots, situate one crossing cell, another beneath cell and between the two lower median nervules, and the third and smallest between the first and second median nervules; posterior wings with the fringe greyish-ochraceous. Wings beneath paler than above; anterior wings with the disk distinctly darker and spotted as above; posterior wings with a discal, rounded, macular darker fascia. Body and legs more or less concolorous with wings.

Exp. wings, ♂ and ♀, 63 to 78 millim.

HAB.—Continental India; Bengal (Horsf. & Moore); Sikkim (de Nic.); Darjeeling (Plötz).—Malay Peninsula; Province Wellesley (coll. Dist.); Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Biggs—coll. Dist.; Pinwill—Brit. Mus.).—Sumatra (Snell.).—Nias Island (Kheil).—Billiton (coll. Godm. & Salv.).—Java; Batavia (Snell.).—Borneo (Druce).—Celebes (Snell.).—China: Foochow (Elwes).

The larva and pupa of this species have been figured by Horsfield and reproduced here (*antea*, p. 367, f. 111), and the first is stated, in Java, to feed on the "Pisang (*Musa paradisiaca*), November and February." \*

\* Cat. Lep. Mus. E. I. C. vol. i. p. 254.

## Genus GANGARA.

*Gangara*, Moore, Lep. Ceyl. vol. i. p. 164 (1881).

This genus is closely allied to the preceding, *Erionota*, and seems to differ principally—so far as I can discover—by the median nervure between the bases of the two upper median nervules being straight, and not curved as in *Erionota*.

1. *Gangara thyrasis*. (Tab. XXXIV., fig. 13.)

*Papilio Thyrasis*, Fabricius, Syst. Ent. p. 532, n. 383 (1775); Mant. Ins. p. 86, n. 781 (1787); Ent. Syst. iii. p. 333, n. 264 (1793).

*Telegonus Thyrasis*, Butl. Cat. Fabr. Lep. p. 262, n. 5 (1869); Wood-Mas. & de Nic. J. A. S. Beng. vol. i. p. 261, n. 127 (1881); *ibid.* p. 238, n. 64 (1881).

*Hesperia Thyrasis*, Plötz, Stett. Ent. Zeit. xliii. p. 331 (1882).

*Hesperia Pautia*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. vol. i. p. 254, t. 7, f. 10, 10*a* (1857); Moore, Proc. Zool. Soc. 1865, p. 790.

*Gangara Thyrasis*, Moore, Lep. Ceyl. vol. i. p. 165, t. 66, f. 3, 3*a* (1881).

Male and Female. Wings above chocolate-brown: anterior wings with six pale ochraceous spots, of which the three largest are discal, and situate one crossing cell, one beneath cell and between the two lower median nervules, and the third between the first and second median nervules, the other three spots are small and subapical (in some specimens there is an additional linear spot on submedian nervure); posterior wings with the fringe greyish-ochraceous. Wings beneath paler than above; anterior wings with the disk darker and spotted as above, the inner marginal area also pale ochraceous, and with a tuft of short hairs in male, the subapical area irrorated with bluish-grey scales; posterior wings irrorated with bluish-grey scales, which form some irregular fasciæ across their surface. Body and legs more or less concolorous with wings.

Exp. wings, ♂ and ♀, 70 to 83 millim.

HAB.—Continental India: Bengal (Moore); Canara (Horsf. & Moore).—Ceylon (Thwaites—coll. Dist.).—Andaman Islands: Port Blair (Calc. Mus.).—Nicobar Islands (Calc. Mus.).—Burma: Moulmein (Brit. Mus.).—Malay Peninsula: Province Wellesley (Birch—coll. Dist.); Perak (Künst.—Calc. Mus.).—Java (Horsf. & Moore).

I am indebted to Mr. J. K. Birch, of Butterworth, Province Wellesley, for a specimen of this species, which, as he wrote to me (under date of April 24th, 1883), was “Caught in my verandah a few nights ago, attracted by the lamp.”

The larva is figured in Moore's ‘Lepidoptera of Ceylon,’\* and is there thus described:—“Larva greyish-white, with a few ochreous dorsal spots and marks. From the body, according to Dr. Thwaites, a loose shaggy filamentous clothing consisting of pure wax † is excreted, but which is easily rubbed off when handled, leaving the larva quite naked. Feeds on Palmaceæ. Pupa palé olivaceous-yellow; the tongue spirally protruded.” ‡

\* Lep. Ceyl. vol. i. tab. 66. f. 3*a*.

† In the Trans. Ent. Soc. for 1876, p. 519, Prof. Westwood published “Notes on the habits of a Lepidopterous Insect parasitic on *Fulgora candelaria*, and states that there is every probability “for our believing that it is upon the waxy secretion of the *Fulgora* that this parasite subsists.”

‡ Lep. Ceyl. vol. i. p. 165.



## Genus HIDARI.

*Hidari*, Distant, *antea*, p. 392.

This genus differs from *Erionota* and *Gangara* in having the upper disco-cellular nervule of the anterior wings longer than the lower; the base of the second median nervule of the anterior wings is also not more than twice as far apart from lower as from upper median nervule.

Three species are found in the Malay Peninsula, and are here included in the genus.

1. *Hidari irava*. (Tab. XXXIV., fig. 15 ♀.)

*Hesperia Irava*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. vol. i. p. 254, n. 583 (1857); Plötz, Stett. Ent. Zeit. xliii. p. 328, n. 80 (1882).

*Celenorrhinus Thruw*, Hübn. (nec Linn.), Zutr. Ex. Schmett. f. 875, 876 (1832).

*Hesperia Hypapa*, Hew. Deser. Hesp. p. 25, n. 7 (1868).

*Erionota Hypapa*, Mab. Ann. Soc. Ent. Belg. xxi. p. 35, n. 115 (1878).

*Casyapa irava*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 553, n. 2 (1877).

*Erionota irava*, Mab. Ann. Soc. Ent. Belg. xxi. p. 35, n. 116 (1878).

Male and Female. Wings above chocolate-brown; anterior wings with the basal costal area rufous and the disk much darker, containing four pale ochraceous spots, situate one in cell and three beneath cell divided by the median nervules and two (sometimes only one) small greyish subapical spots; posterior wings with the fringe greyish-ochraceous. Wings beneath very much paler than above; anterior wings with the disk blackish, spotted as above, and with small fuscous spots divided by the lower discoidal nervule; posterior wings with usually four small fuscous discal spots in curved series. Body and legs more or less concolorous with wings.

Exp. wings, ♂ and ♀, 52 to 64 millim.

HAB.—Malay Peninsula; Penang (coll. Dist.); Perak (Künst.—coll. Dist.); Malacca (coll. Staud.; Pinwill—Brit. Mus.; Biggs—coll. Dist.).—Java (Horsf.).

2. *Hidari sybirita*. (Tab. XXXV., fig. 24.)

*Hesperia Sybirita*, Hewitson, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 451 (1876).

Wings above chocolate-brown; anterior wings with three discal pale ochraceous spots, one in cell and two beneath, divided by the second median nervule, and three small subapical greyish spots in suberect series; posterior wings with the fringe greyish-ochraceous. Wings beneath paler than above; anterior wings with the inner and subapical areas somewhat violaceous, and spotted as above; posterior wings with a discal constellation of dark fuscous spots.

Exp. wings, 68 millim.

HAB.—Malay Peninsula; Singapore (coll. Hewitson).

The figure is taken from the typical specimen in the collection of the late Mr. Hewitson, and this constitutes at present my whole knowledge of the species.

3. *Hidari staudingeri*, *n. sp.*\* (Tab. XXXV., fig. 25).

Wings above chocolate-brown; anterior wings with an ochraceous, irregularly transverse discal macular fascia, composed of one spot in cell and three spots beneath divided by the two lower median

\* Named after Dr. Staudinger, of Dresden, the great living authority on Palearctic Lepidoptera.

nervules, and two minute greyish subapical spots: posterior wings with the fringe brownish-grey. Wings beneath as above, but the lower spot of the macular fascia to the anterior wings having its posterior half greyish-white. Body and legs more or less concolorous with wings.

Exp. wings, 52 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).

This very distinct species is contained in the collection of Dr. Staudinger, and I have not seen a second example.

### Genus PLASTINGIA.

*Plastingia*, Butler, Ent. Mo. Mag. vol. vii. p. 95 (1870).

This genus differs from *Hidari* in having the upper and lower disco-cellular nervules of the anterior wings almost subequal in length, thus agreeing with *Erionota* and *Gangara*, but easily distinguished in a structural sense from those genera by the position of the second median nervule of the anterior wings, which has its base about three times as far apart from that of the lower as from that of the upper median nervule. Another distinguishing character in *Plastingia* is the position of the first subcostal nervule of the anterior wings, which is emitted more nearly opposite the base of second than that of lower median nervule.

*Plastingia*, as at present known, is a small genus, and its species appear to be principally found in the Indo-Malayan Region. Several have been described from Borneo.

#### 1. *Plastingia callineura*. (Tab. XXXV., fig. 26.)

*Hesperia Callineura*, Felder, Reise Nov. Lep. iii. p. 513, n. 895, t. 71, f. 9, 10 (1866).

*Plastingia callineura*, Druce, Proc. Zool. Soc. 1873, p. 359, n. 2; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 1 (1877); Mab. Ann. Soc. Ent. Belg. xxi. p. 36, n. 132 (1878); Plotz, Stett. Ent. Zeit. xlv. p. 148, n. 12 (1884).

*Hesperia Latoia*, Hewits. Deser. Hesp. p. 34, n. 27 (1868); Ex. Butt. Hesp. t. 6, f. 62, 63 (1873).

*Plastingia Latoia*, Plötz, Stett. Ent. Zeit. xlv. p. 149, n. 13 (1884).

Wings above dark chocolate-brown; anterior wings with basal costal, subcostal, and inner marginal ochraceous streaks, and with a discal series of seven pale semi-hyaline spots, of which the largest is bifid and situate above the lower median nervule, three—the uppermost smallest—in oblique series separated by the lower discoidal and the upper median nervules, two small and subapical and one in and near end of cell; posterior wings with a central transverse fascia connected with base, a narrow streak along inner edge of abdominal margin and the fringe ochraceous. Wings beneath paler than above; anterior wings spotted as above and with a series of dark submarginal streaks placed between the nervules; posterior wings with the neuration ochraceous, the discal fascia as above, and with a submarginal series of minute ochraceous spots. Body above brownish, with segmental ochraceous fasciæ; body beneath pale ochraceous, abdomen with a central series of dark brownish spots; legs brownish.

Exp. wings, 38 millim.

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.); Singapore (coll. Hewits.; Wall.—coll. Godm. & Salv.).—Java; Buitenzorg (Felder).

Mr. Hewitson redescribed this species under the name of *Hesperia latoia*, and the figure here given represents the typical specimen in the Hewitsonian Cabinet. According to the writer's experience the species is moderately rare in the Malay Peninsula.

## Genus HYAROTIS.

*Hyarotis*, Moore, Lep. Ceyl. vol. i. p. 174 (1881).

This genus can be readily distinguished from the preceding—*Plastingia*—by the position of the first subcostal nervule of the anterior wings, which is emitted more nearly opposite the base of the lower than of the second median nervule.

A single species (according to present knowledge), and one which is given by Mr. Moore as the type of the genus, is found in the Malay Peninsula.

1. *Hyarotis adrastus*. (Tab. XXXIV., fig. 4.)

*Papilio Adrastus*, Cramer, Pap. Ex. iv. t. 319, F, G (1782).

*Tagiades Adrastus*, Druce, Proc. Zool. Soc. 1874, p. 109, n. 1.

*Hesperia Adrastus*, Plötz, Stett. Ent. Zeit. xlv. p. 30, n. 240 (1883).

*Hyarotis Adrastus*, Moore, Lep. Ceyl. vol. i. p. 174, t. 67, f. 5, 5a (1881); Proc. Zool. Soc. 1882, p. 262; de Nic. J. A. S. Beng. vol. lii. p. 99, n. 274 (1883).

Wings above chocolate-brown; anterior wings with seven pale greyish semi-hyaline spots, situate one in cell, three in oblique series beneath cell divided by the two lower median nervules, and three small and subapical in suberect series; posterior wings with the fringe greyish-brown. Anterior wings beneath spotted as above, the outer half paler and with a distinct darker submarginal fascia; posterior wings beneath with the basal third chocolate-brown, the discal third more or less violaceous, and the outer third pale fuscous; the discal third contains some irregularly formed greyish-white spots, and the outer third has an inner dark macular fascia. Body above chocolate-brown; body beneath and legs paler brown.

Exp. wings, 40 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—Moore); Sikkin (de Nic.).—Ceylon (Moore).—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Malacca (coll. Staud.).—Siam; Naheonchaisee (Druce).—Java (Plötz).

It is not accurate to speak of any species belonging to this family as being really rare in the Malay Peninsula, the *Hesperidae* having been so little worked, but certainly *H. adrastus* is not common in collections belonging to the fauna, as one specimen in my own collection and another in that of Dr. Staudinger are the only Malay examples I have seen.

## Genus COLADENIA.

*Coladenia*, Moore, Lep. Ceyl. vol. i. p. 180 (1881).

This genus differs from all those of the *Erionotaria* here previously enumerated in having the anterior wings short, and not twice as long as broad. The anterior wings have the upper disco-cellular nervule a little shorter than the lower, the second median nervule has its base about twice as far apart from that of the lower as from that of the upper median nervule; the posterior wings have the subcostal nervules bifurcating near end of cell, the first and second median nervules having an apparently common origin near end of cell. Body robust and pilose; palpi laterally compressed; antennæ with a well-formed apical club moderately hooked at tip; posterior tibiæ with two prominent spines.

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1. *Coladenia dan*. (Tab. XXXV., fig. 27.)

*Papilio Dan*, Fabricius, Mant. Ins. ii. p. 88, n. 798 (1787); Ent. Syst. iii. p. 341, n. 297 (1793).

*Hesperia Eacus*, Latr. Enc. Méth. ix. p. 738, n. 25 (1823).

*Hesperia Fatih*, Koll. Hügl. Kaschm. iv. 2, p. 451, t. 18, f. 5, 6 (1848).

*Hesperia Dan*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 253, n. 580 (1857).

*Hesperilla Dan*, Butl. Cat. Fabr. Lep. p. 271, n. 1 (1869).

*Pleisoneura Dan*, Moore, Proc. Zool. Soc. 1865, p. 789; Snell. Tijd. Ent. xix. p. 158, n. 80 (1876); ib. xxi. p. 41, n. 178 (1878); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 556, n. 4 (1877).

*Coladenia Dan*, De Nic. J. A. S. Beng. lii. p. 100, n. 282 (1883).

Wings above rufous-brown; anterior wings with four discal greyish-white spots, one—largest and sublunate—in cell, a smaller spot above it and two beneath cell divided by the second median nervule, and three—sometimes two—small subapical greyish-white spots in suberect series, outer half of wing with obscure dark fasciæ; posterior wings with discal and outer marginal dark fasciæ. Wings beneath as above, but slightly paler. Body and legs more or less concolorous with wings.

Exp. wings, 30 millim.

HAB.—Continental India; Bengal (Moore); Sikkim (de Nic.).—Malay Peninsula; Perak (Townsend—coll. Godm. & Salv.); Malacca (Pinwill—Brit. Mus.).—Java (Brit. Mus.); Batavia (Snell.).—Celebes (Snell.).

A Malaccan specimen, captured by Capt. Pinwill, and contained in the British Museum, is here figured.

## Genus UDASPES.

*Udaspes*, Moore, Lep. Ceyl. vol. i. p. 177 (1881).

In *Udaspes* the upper disco-cellular nervule of the anterior wings is longer than the lower, and the base of the second median nervule is more than twice as far apart from that of the lower as from that of the upper median nervule.

1. *Udaspes folus*. (Tab. XXXIV., fig. 3.)

*Papilio Folus*, Cramer, Pap. Ex. i. t. 74, F (1779).

*Hesperia Cicero*, Fabr. Ent. Syst. iii. 1, p. 338, n. 287 (1793); Latr. Enc. Méth. ix. p. 787, n. 154 (1823).

*Pterygospidea Folus*, Moore, Proc. Zool. Soc. 1865, p. 778.

*Tagiades Folus*, Butl. Cat. Fabr. Lep. p. 283, n. 3 (1869).

*Pleisoneura Folus*, Druce, Proc. Zool. Soc. 1874, p. 109, n. 1; Snell. Tijd. Ent. xix. p. 158, n. 79 (1876);

Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 556, n. 1 (1877); Proc. Zool. Soc. 1877, p. 815, n. 41;

Mab. Ann. Soc. Ent. Belg. xxi. p. 33, n. 99 (1878).

*Udaspes Folus*, Moore, Lep. Ceyl. vol. i. p. 177, t. 68, f. 3, 3a (1881); Proc. Zool. Soc. 1882, p. 263; de Nic. J. A. S. Beng. vol. li. p. 65, n. 200 (1882).

Wings above dark olivaceous-brown, the fringe alternately greyish-white; anterior wings with the following greyish-white spots:—one in cell, two beneath cell which are contiguous and only separated by the lower median nervule, one—small—between the first and second median nervules, two submarginal separated by the lower discoidal nervule, and three subapical which are more or less fused and sometimes preceded by a minute fourth spot near costa; posterior wings with a broad, irregularly shaped, and outwardly angulated greyish-white discal fasciate patch. Anterior wings beneath somewhat paler, spotted as above, and with a pale fascia near apex; posterior wings beneath much paler than above and somewhat greyish, the costal area and a patch on outer margin castaneous, the fasciate patch more or less continued

towards base, a subcostal greyish-white spot, and a central dark castaneous linear spot. Body above olivaceous-brown, beneath with legs greyish.

Exp. wings, ♂ and ♀, 45 to 50 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—Moore); Bengal (Moore); Sikkim (de Nic.).—Ceylon (Moore).—Malay Peninsula; Perak (coll. Godfery; Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (Wallace—coll. Godm. & Salv.).—Siam; Chentaboon (Druce).—Java (Mabille).

### Genus PLESIONEURA.

*Plesioneura*, Felder, Wien. Ent. Mon. vi. p. 29 (1862); Moore, Lep. Ceyl. vol. i. p. 177 (1881).

In this genus the inner margin of the anterior wings is longer than the outer margin, thus agreeing with the two following genera, but it possesses a distinctive character in the position of the second median nervule to the anterior wings, which has its base close to that of the upper and remote from the lower median nervule, or more than twice as far apart from that nervule as from the upper one.

#### 1. *Plesioneura alysos*. (Tab. XXXIV., fig. 7).

*Plesioneura Alysos*, Moore, Proc. Zool. Soc. 1865, p. 789; *ibid.* 1877, p. 593; Lep. Ceyl. vol. i. p. 178, t. 67, f. 3, *a, b* (1881); Proc. Zool. Soc. 1882, p. 263; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 556, n. 2 (1877); Wood-Mas. & de Nic. J. A. S. Beng. vol. xlix. p. 241, n. 80 (1880); de Nic. J. A. S. Beng. vol. L. p. 60, n. 128 (1881); Mab. Ann. Soc. Ent. Belg. xxi. p. 33, n. 98 (1878).

*Hesperia Alysos*, Horsf. & Moore, MS. Cat. Lep. Mus. E. I. C. vol. i. p. 253, n. 577 (1857).

Male. Wings above dark fuscous; anterior wings with a discal transverse whitish fascia, crossing wing near end of cell and not reaching either the costal or inner margins and with a small whitish spot between the upper median and the lower discoidal nervule. Anterior wings beneath paler than above, especially near outer margin, the fascia and spot as above, but the first more or less connected with the costal margin; posterior wings beneath much paler than above, with a somewhat indistinct darker curved discal fascia. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 30 to 38 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—Moore); Bengal (Moore); Sikkim (de Nic.).—Ceylon (Moore).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Malay Peninsula; Penang (coll. Dist.); Province Wellesley (coll. Dist.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (Wallace—coll. Godm. & Salv.).—Java (Mab.).

The female, as found in Ceylon, is thus described by Mr. Moore:—"Forewing with broader medial band, three subapical spots, the spot between upper median and radial, and sometimes another between the upper and middle medians."\*

Mr. Moore also describes the Ceylonese males as having "either one or two very small oblique subapical spots," but there is no trace of these in any of the specimens from the Malay Peninsula which I have examined.

The larva as observed in Ceylon is described as "pale green, white speckled; head black bordered. Feeds on Zinziberacæ."†

\* Lep. Ceyl. vol. i. p. 178 (1881).

† *Ibid.*

Mr. de Nicéville states, from observations made in Sikkim, that this species "always settles with expanded wings."\*

2. *Plesioneura asmara*. (Tab. XXXV., fig. 28.)

*Plesioneura Asmara*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 556, n. 3 (1877).

*Hesperia Asmara*, Horsf. & Moore, MS. Cat. Lep. Mus. E. I. C. vol. i. p. 253, n. 576 (1857).

The figure here given is taken from a Malaccan specimen in the British Museum, and the following is Mr. Butler's original description:—

"Similar to *P. dan*, † but not tawny-tinted, the three spots in the centre of primaries united, and hyaline-white."

Exp. wings, ♂ & ♀, "1 inch 8 lines."

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).—Java (Horsf. & Moore).

This species is much more closely allied to *P. alysos*, and appears remote in appearance from *C. dan*.

3. *Plesioneura pinwilli*. (Tab. XXXV., fig. 29 ♂.)

*Plesioneura Pinwilli*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 556, n. 5, t. lxxviii. f. 4 (1877).

As with the last species, Mr. Butler's figure and description are reproduced:—

"Primaries black, with a bluish shot; a broad oblique shining pale-yellow subhyaline patch, separated by the median nervule and its second and third branches into three spots; two small spots of the same colour, placed obliquely below it, on the interno-median interspace; secondaries bright orange, the base and the apical portion of external border chocolate-brown; remainder of outer border, a rounded spot at end of cell, a second near anal angle, and five, submarginal, touching the outer border, black; head and thorax greenish grey, vertex of head edged with sordid white; abdomen orange banded with black. Primaries below as above, excepting that there is a bifid whitish spot above the end of the cell, a whitish spot at base of interno-median area, and that the inner margin is brown; secondaries bright orange; the costal and outer borders irregularly purplish black; fringe brownish; a subcostal dash, a rounded spot at the end of the cell, and a reniform spot near the anal angle black; body below and legs bright ochreous, palpi pale ochreous; neck below white; antennae black above, testaceous below."

Exp. wings, "2 inches 2 lines."

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.).

This is a rare species, and is only known to the writer by the single specimen captured by Capt. Pinwill, and now contained in the British Museum.

Genus ASTICTOPTERUS.

*Astictopterus*, Felder, Wien. Ent. Mon. iv. p. 401 (1860); Moore, Lep. Ceyl. vol. i. p. 162 (1881).

This genus differs from *Plesioneura* by having the base of the second median nervule of the anterior wings about twice as far apart from that of the lower as from that of the upper median nervule; the first subcostal nervule of the anterior wings is emitted more nearly opposite the base of the lower than of the second median nervule.

\* J. A. S. Beng. vol. L. p. 60 (1881).

† *Coladenia dan*, antea, p. 398.

1. *Astictopterus jama*.

*Astictopterus jama*, Felder, Wien. Ent. Mon. iv. p. 401, n. 29 (1860); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 1 (1877).

Wings above and beneath uniform dark fuscous. Body above concolorous with wings; abdomen beneath and legs somewhat greyish-brown.

Exp. wings, 32 to 34 millim.

HAB.—Malay Peninsula; Perak (Townsend—coll. Godm. & Salv.); Sungei Ujong (Durnford—coll. Dist.); Malacca (colls. Feld. & Staud.; Pinwill—Brit. Mus.).—Sumatra (coll. Staud.).—Java; Bantam (coll. Dist.).

This is apparently a very widely distributed species, but on account of its small size and obscure appearance it probably frequently escapes the collector's net. It has not been considered necessary to figure this species, as its uniform coloration renders it easily distinguishable.

2. *Astictopterus salsala*. (Tab. XXXIV., fig. 21.)

*Nisomiades Salsala*, Moore, Proc. Zool. Soc. 1865, p. 786.

*Cyclopides Salsala*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 1 (1877).

Wings above dark fuscous; anterior wings with a transverse curved series of rufous spots crossing wing beyond cell, the so-called spots consisting of scattered groups of scales. Wings beneath rufous-brown; anterior wings with the rufous spots above bluish-grey beneath, and generally with a small cluster of similarly coloured spots (variable in number) in cell; posterior wings with some discal spots of the same colour, also variable in number in different specimens. Body and legs concolorous with wings.

Var. *a*.

*Astictopterus stellifer*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 7 (1877); Moore, Lep. Ceyl. vol. i. p. 163 (1881).

This variety simply differs from what is understood as the typical form of *A. salsala* by the absence (and probably accidental obliteration) of the scale-like spots on the upper surface of the anterior wings.

Exp. wings, 26 to 28 millim.

HAB.—Continental India; Bengal (Moore).—Ceylon (Thwaites—coll. Dist.).—Malay Peninsula; Perak (Townsend—coll. Godm. & Salv.); Malacca (Pinwill—Brit. Mus.; Biggs—coll. Dist.); Singapore (Kerr—coll. Dist.).—Nias Island (coll. Dist.).

There is little doubt that this proposed species of Mr. Butler (*A. stellifer*) is simply a variety of *A. salsala*. In fact, the process of reunion has already commenced, as, though they were originally enumerated by Mr. Butler in different genera, they now—or rather did on the 29th March last—appear arranged in the same genus in the National Collection. It is no doubt a variable species. Mr. Moore cited his Ceylonese species as *A. stellifer*, Butl.; but on my visit to the British Museum (on the above-named date) Mr. Butler had separated the specimens received from Ceylon as distinct from his *A. stellifer*. It is therefore not beyond possibility that the Ceylon forms may yet be described as a “new species.”

3. *Astictopterus xanites*. (Tab. XXXIV., fig. 28.)

*Astictopterus xanites*, Butler, Trans. Ent. Soc. 1870, p. 510; Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 2, t. lxxix. f. 7 (1877); Druce, Proc. Zool. Soc. 1873, p. 359, n. 2; Mab. Ann. Soc. Ent. Belg. xxi. p. 43, n. 179 (1878).

Wings above dark fuscous: anterior wings with a sanguineous transverse fascia not reaching costal or inner margins and crossing wing at end of cell. Wings beneath as above, but the transverse fascia to the anterior wings broader and paler than above and approaching nearer to the costal margin. Body and legs dark fuscous.

Exp. wings, 32 millim.

HAB.—Malay Peninsula; Sungei Ujong (Biggs—coll. Dist.); Malacca (Pinwill—Brit. Mus.).—Java (Mabille).—Borneo; Sandakan (Pryer—coll. Dist.); Sarawak (Butl.).

4. *Astictopterus sindu*. (Tab. XXXV., fig. 30.)

*Astictopterus Sindu*, Felder, Wien. Ent. Mon. iv. p. 401, n. 30 (1860); Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 6 (1877).

The specimen collected by Capt. Pinwill in Malacca, and now contained in the collection of the British Museum, is here figured, and the following is Felder's original description:—

“Alis utrinque fuscis, anticis fascia lata transversa subsinuata fulvo-aurantiaca. ♂.”

“Præcedenti\* affinis, sed minor pedibusque gracilioribus instructus.”

HAB.—Malay Peninsula; Selangor; Kwala Lumpur (Biggs—coll. Dist.); Malacca (coll. Felder—Pinwill—Brit. Mus.).

The small size of this species and the position of its transverse fascia on the anterior wings are the characters which apparently identify it. It appears to be a moderately scarce species; one specimen only—mutilated—is in my collection.

## Genus KERANA.

*Kerana*, Distant, *antea*, p. 392.

This genus is closely allied to *Astictopterus*, but structurally differs by having the first subcostal nervule of the anterior wings emitted more nearly opposite the base of the second than of the lower median nervule.

1. *Kerana armata*. (Tab. XXXV., fig. 31.)

*Astictopterus Armatus*, Druce, Proc. Zool. Soc. 1873, p. 359, n. 3, t. 33, f. 7; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 4 (1877).

Wings above dark chocolate-brown; anterior wings with a broad, transversely oblique dark orange-yellow fascia, which is convexly rounded outwardly and nearly straight inwardly, crossing wing at about end of cell. Wings beneath as above, but a little paler in hue, the fascia to the anterior wings being also paler than above. Body and legs concolorous with wings.

Exp. wings, 50 millim.

HAB.—Malay Peninsula Malacca (coll. Stand.; Pinwill—Brit. Mus.); Singapore (coll. Godfery).—Borneo (Druce).

\* *A. jama*, Feld.



2. *Kerana gemmifer*. (Tab. XXXIV., fig. 29.)

*Astictopterus gemmifer*, Butler, Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 3 (1877).

Wings above dark chocolate-brown; anterior wings with a broad and outwardly rounded transversely oblique orange-yellow fascia crossing wings at about end of cell. Wings beneath as above, the fascia to anterior wings slightly paler. Body and legs concolorous with wings.

Exp. wings, 32 to 34 millim.

HAB.—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.); Singapore (Wallace—coll. Godm. & Salv.).

3. *Kerana aurivittata*, var. *cameroni*.\* (Tab. XXXIV., fig. 19.)

*Plesioneura Aurivittata*, Moore, Proc. Zool. Soc. 1878, p. 843.

*Plesioneura Cameroni*, Dist. Ann. & Mag. Nat. Hist. ser. 5, vol. x. p. 248 (1882).

Wings above chocolate-brown; anterior wings with an obliquely transverse yellow fascia crossing wing at about end of cell, and three small fused pale subapical spots. Wings beneath as above, the colour somewhat duller, and the posterior wings having an obscure yellowish spot at end of cell. Body and legs concolorous with wings.

Exp. wings, 38 millim.

HAB.—Tenasserim; "above Ahsown" (Moore).—Malay Peninsula; Penang (coll. Dist.); Province Wellesley (coll. Säuer); Perak (Künst.—Calc. Mus.).

This variety differs from typical *K. aurivittata* in the shape of the fascia of the anterior wings, which, as depicted by Mr. Moore, is widened beneath the cell. Although I previously described the form here figured as specifically distinct, I think its natural position is better represented by the formula "variety."

4. *Kerana diocles*. (Tab. XXXIV., fig. 8.)

*Nisoniades Diocles*, Moore, Proc. Zool. Soc. 1865, p. 787; Horsf. & Moore (MS.), Cat. Lep. Mus. E. I. C. vol. i. p. 250, n. 562 (1857).

*Astictopterus Diocles*, Druce, Proc. Zool. Soc. 1873, p. 359, n. 1; Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 555, n. 5 (1877); de Nic. J. A. S. Beng. vol. L. p. 60, n. 126 (1881).

Wings above fuscous-brown, with a slight bronzy tinge, the fringe greyish-brown; wings beneath paler than above, both wings with a submarginal paler fascia, the inner marginal area of the anterior wings somewhat greyish-brown. Body and legs more or less concolorous with wings.

Exp. wings, ♂ & ♀, 46 to 57 millim.

HAB.—Continental India: Bengal (Moore); Sikkim (de Nic.).—Malay Peninsula; Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Pinwill—Brit. Mus.; Wallace—coll. Godm. & Salv.; Biggs—coll. Dist.); Singapore (Kerr—coll. Dist.).—Java (Horsf. & Moore); Bantam (coll. Dist.).—Borneo (Druce).

In Sikkim Mr. de Nicéville found this species "the commonest *Hesperia* seen. Settles with closed wings." †

\* Named after John Cameron, author of 'Our Tropical Possessions in Malayan India.'

† J. A. S. Beng. vol. L. p. 60 (1881).

## SPECIES INCERTÆ SEDIS.

**Plesioneura? anthea.** (Tab. XXXV., fig. 32.)*Hesperia Anthea*, Hewitson, Descr. Hesp. p. 29, n. 17 (1868).*Cobalus ciliatus*, Butl. Trans. Linn. Soc. ser. 2, Zool. vol. i. p. 554, n. 2 (1877).

This species is only known to the writer by the typical specimen in the Hewitsonian cabinet (here figured) and the specimen in the British Museum Collection presented by Capt. Pinwill, which was redescribed by Mr. Butler under the name of *Cobalus ciliatus*. Mr. Hewitson's description is here reproduced:—

“Upperside dark brown. Anterior wings with five small transparent white spots: two between the median nervures and three before the apex. Posterior wing with a broad band of white from the inner margin to the middle; the fringe white.”

“Underside as above, except that the white band is broader and crosses the whole of the wing.”

Exp. wings, “ $1\frac{3}{8}$  inch.”

HAB.—Malay Peninsula; Malacca (Pinwill—Brit. Mus.); Singapore (coll. Hewitson).

**Astictopterus? harmachis.***Astictopterus harmachis*, Hewitson, Ann. & Mag. Nat. Hist. ser. 5, vol. i. p. 341 (1878).

This species was described by Mr. Hewitson as from Sumatra and Malacca, but it is only represented by a Sumatran specimen in the Hewitsonian cabinet, and although the describer said, “Also in coll. Dr. Staud. from Malacca,” Dr. Staudinger writes me that he is unable to trace the specimen. I therefore merely draw attention to the species as doubtfully belonging to our fauna.

## APPENDIX.

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SINCE the commencement of this publication, in 1882,\* much additional information has been acquired, some new species discovered, and many other known species, not hitherto recorded from the Malay Peninsula, have been received from various helpful collectors and lepidopterists. These are now included, and though doubtless many others have still to be captured and enumerated, the present work must be brought to a conclusion.

Subfam. DANAINÆ.—Group DANAINA (*antea*, p. 3).

In 1883 Mr. Moore published his “Monograph of *Limnaina* and *Euplœina*, &c.” †—in other words, a monographic list of the genera and species belonging to this group. Mr. Moore approaches the subject in an analytical spirit, and has thus described many genera and species which fail to find acceptance with lepidopterists of more synthetical views and method, and he has also made several useful corrections to the synonymy, all of which, so far as they relate to species found in this fauna, are duly referred to.

Genus HESTIA (*antea*, p. 5).

### 1. *Hestia lynceus* (*antea*, p. 6).

Reference has been made to the general variability in size and hue as found in different specimens of this species. ‡ Mr. Moore has estimated and described these forms as distinct species, limiting the true *H. lynceus* to Borneo, describing three new species as found in the Malay Peninsula, and also specifically separating the Javan and a Sumatran representative of the species. As the writer inclines to the purely varietal view of these characters, he adds to the synonymy of *H. lynceus* :—

*Hestia Reinwardti*, Moore, Proc. Zool. Soc. 1883, p. 218, n. 3.

*Hestia Logani*, Moore, *ibid.* n. 4.

*Hestia Donorani*, Moore, *ibid.* n. 5.

This species has now been recorded by Messrs. Marshall and de Nicéville as not uncommon in the southern portions of Continental India, § and Perak must also be added to the Malay districts in which it is found.

\* During this interval some valuable contributions to a knowledge of tropical Rhopalocera have been published. Messrs. Salvin and Godman have completed the first volume of their work on the Central American Rhopalocera; the first volume has also appeared of Messrs. Marshall and de Nicéville's ‘Butterflies of India, Burmah, and Ceylon’; whilst Herr Georg Semper is just commencing to publish his description of the Rhopalocera of the Philippine Islands.

† Proc. Zool. Soc. 1883, pp. 201 and 253.

‡ *Antea*, p. 7.

§ ‘Butt. India, Burmah, and Ceylon,’ vol. i. p. 25.—It was also captured in the Madura district by my late friend F. E. Robinson, whose untimely death by a tiger is deplored by many friends and entomologists alike.

Its habits on the "Indian Hills" have been described by Mr. E. L. Arnold as "water-loving." "Their favourite habit is to lazily flap their wide wings while ascending to the tops of the trees, and then, keeping their wings spread out to the full on either side, they let themselves come slowly sailing down in wide circles, like large white blossoms, until just at the surface of the water, when they flutter over their own bright reflection for a moment, and again rise up to the tree-tops—a happy, lazy sort of way of spending existence, which I was generally reluctant to disturb."\*

## 2. *Hestia linteata* (*antea*, p. 7).

I have received specimens from Banjarmassin—South Borneo—which only slightly vary from typical forms of the species.

By an oversight the reference to the figure was printed "Tab. II., fig. 1," instead of Tab. I., fig. 1.

## 3. *Hestia leuconoe*. (Tab. XXXIX., fig. 3 ♀.)

*Idea Leuconoe*, Erichson, Nova Acta Ac. Nat. Cur. xvi. p. 283 (1834).

*Hestia Leuconoe*, Doubl. & Hew. Gen. Diurn. Lep. t. 13, f. 2 (1847); Druce, Proc. Zool. Soc. 1873, p. 337, n. 1;

Semp. Schmiett. Philippin. Ins. p. 6, n. 2, t. 1, f. 3, 4, 5 (1886).

*Nectaria Leuconoe*, Moore, Proc. Zool. Soc. 1883, p. 216, n. 6.

*Hestia clara*, Butl. Trans. Ent. Soc. 1867, p. 469.

*Nectaria clara*, Moore, Proc. Zool. Soc. 1883, p. 217, n. 8.

*Nectaria labuana*, Moore, MS.

Male and Female. Wings semihyaline, creamy white, more or less suffused with yellow on basal areas, neuration black. Anterior wings above with the following black markings:—some black longitudinal lines in cell, and a macular fascia crossing cell near centre, a waved disco-cellular spot at end of cell, a much angulated and waved discal fascia commencing at costa and terminating on inner margin, between which and the median nervure are two spots separated by the lower median nervule—the lowermost largest—and a waved submarginal fascia enclosing a marginal series of pale spots; posterior wings with the following black markings:—two black longitudinal lines in cell, united towards base and the uppermost cellular at disco-cellular nervule, a spot a little beyond middle of cell, and discal and submarginal fasciæ as on anterior wings. Wings beneath marked generally as above. Body greyish-white; head above spotted with black; thorax with two black stripes; abdomen with a central dorsal stripe; thorax beneath and legs streaked with black.

Exp. wings, ♂, 120 millim.; ♀, 155 millim.

HAB.—Malay Peninsula; Singapore (Kerr—coll. Dist.).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).—Philippines; Manilla (coll. Dist.).—Formosa (Brit. Mus.).

I am indebted to Capt. Jno. Manners Kerr for the first knowledge of this species occurring in the Malay Peninsula. Capt. Kerr forwarded me two specimens from Singapore, one of which was taken by A. P. Wodehouse, Esq., in a Mangosteen orchard, and the other by himself.

This species, like its allies, varies widely in appearance, and Herr Georg Sempier informs me that he has been able to trace complete gradation from typical examples to the forms *clara*, Butl., and *labuana*, Moore.

\* 'On the Indian Hills,' p. 194.

Genus IDEOPSIS (*antea*, p. 8).2. *Ideopsis daos* (*antea*, p. 8).

I have examined a very pale specimen of this species, which was collected by Herr Künstler in Perak, and one which bears the same relationship to typical smoky forms as is exhibited by the varieties of species in the preceding genus *Hestia*.

Genus RADENA (*antea*, p. 9).1. *Radena juvena*. (Tab. XXXIX., fig. 4.)

*Papilio Juventa*, Cramer, Pap. Ex. ii. t. 188, B (1779).

*Danaïs Juventa*, Godt. Enc. Méth. ix. p. 193, n. 54 (1819); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 122, n. 240 (1857); Druce, Proc. Zool. Soc. 1873, p. 337, n. 3; Semp. Verh. Zool. bot. Ges. Wien. 1867, p. 698; Godm. & Salv. Proc. Zool. Soc. 1878, p. 637, n. 4; Dewitz, Nov. Act. Leop. Carol. Ac. xlv. Nr. 2, p. 259, t. 2, f. 6, A, B. (1882).

*Radena Juventa*, Moore, Proc. Zool. Soc. 1883, p. 224, n. 6, t. xxix. f. 1; Semp. Schmett. Phillip. Ins. p. 8, n. 5, t. A, f. 1 (1886).

*Radena Manillana*, Moore, Proc. Zool. Soc. 1883, p. 224, n. 7.

Male and Female. Wings above fuscous, with pale bluish-grey markings; anterior wings with a basal subcostal streak, followed by three subcostal spots, a large cellular fascia more or less broken near middle, two spots beyond cell, three large spots beneath cell, divided by the two lower median nervules, the lowermost of which is very large and more or less divided by a fuscous streak, three subapical spots, a submarginal series of somewhat rounded spots and a marginal series of much smaller spots; posterior wings with the cellular area bluish-grey, surrounded by six elongate spots of the same colour, which are divided by the nervules, and of which the lowermost is very large, submarginal and marginal series of spots and the abdominal margin bluish-grey. Wings beneath as above, but somewhat paler. Body above fuscous; head and thorax spotted with greyish; thorax beneath, palpi and legs spotted and streaked with greyish.

Exp. wings, 72 to 83 millim.

HAB.—Malay Peninsula; Singapore (Godfery—coll. Dist.).—Billiton (Godm. & Salv.).—Java (coll. Dist.).—Lombok (Moore).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).—Philippines (coll. Dist.); Manilla, South Luzon (Moore).

A specimen captured by Capt. Godfery at Singapore has enabled me to add this insular species to our fauna.

Genus DANAIS (*antea*, p. 11).

Attention was previously drawn (*antea*, p. 13) to an observation made by Mr. Meldola tending to show that the species of this genus possess an immunity after death from the attacks of mites and other museum pests. This has since been corroborated by Mr. Jenner Weir as regards some Indian specimens.\* On the other hand, Mr. W. F. Kirby has kindly drawn my attention to the fact that several species of *Chalcis* have been reared from East Indian Danaids.†

\* 'Entomologist,' vol. xv. p. 160 (1882).

† *C. cuplæa*, Hope, Proc. Ent. Soc. ser. ii. p. vi. t. 2, f. 9 and 10, also *C. albicus*, Klug. Symb. Phys. t. 37, f. 9, parasitic on *D. chrysippus*.

2. *Danais melaneus* (*antea*, p. 14.)

*Caduga Banksii*, Moore, Proc. Zool. Soc. 1883, p. 251, n. 8.

Mr. Moore has named the above varietal form as a distinct species, a course with which I cannot agree, as typical forms of *D. melaneus* have since been received from Perak and other portions of the Malay Peninsula.

5. *Danais genutia* (*antea*, p. 18.)

*Salatura intermedia*, Moore, Proc. Zool. Soc. 1883, p. 241, n. 6.

As before remarked, in nearly every series of *D. genutia* received from the Malay Peninsula there is found a variety in which the posterior wings have the fulvous-red much suffused with white (Tab. II., fig. 3). Mr. Moore has since described this variety as a distinct species under the name of *S. intermedia*, and in his monograph has separated it from the typical form of *D. genutia* by the intervention of four other species. The reasons, however, for thus treating this usually recognised variety as a distinct species are unfortunately not given. Its purely varietal nature has been further exemplified by the subsequent examination of a Perak specimen in which the fulvous shading is mixed with the white of the posterior wings.

7. *Danais chrysippus* (*antea*, p. 20), *var. alcippoides*. (Tab. XL., fig. 13.)

*Limnas Alcippoides*, Moore, Proc. Zool. Soc. 1883, p. 238, n. 3, t. 31, f. 1.

*Danais Alcippus*, Marsh. & de Nic. Butt. Ind. Burm. & Ceyl. vol. i. p. 51 (1882).

This variety bears the same relationship to *D. chrysippus* as a similar variety does to *D. genutia*. Messrs. Marshall and de Nicéville incline to this varietal opinion, although provisionally keeping it under a distinctive name. The specimen figured was captured at Singapore by Capt. Godfery; it is also reported as found occasionally in Continental India and Rangoon.\*

8. *Danais tytia*, *var.* (Tab. XLI., fig. 15 ♂.)

*Euploea Tytia*, Gray, Lep. Ins. Nepal. p. 9, t. 9, f. 2 (1833).

*Danais Tytia*, Doubl. List Lep. Brit. Mus. i. p. 50 (1844); Doubl. & Hewits. Gen. Diurn. Lep. t. 12, f. 4 (1847);  
Butl. Proc. Zool. Soc. 1877, p. 810, n. 4.

*Danais Sita*, Koll. Hüg. Kaschm. iv. p. 424, t. 6 (1848).

*Danais (Chittira) tytia*, Marsh. & de Nic. Butt. Ind. Burm. & Ceyl. vol. i. p. 42 (1882).

*Caduga tytia*, Moore, Proc. Zool. Soc. 1883, p. 249, n. 1.

*Caduga nipponica*, Moore, Proc. Zool. Soc. 1883, p. 249, n. 2.

*Caduga swinhoei*, Moore, Proc. Zool. Soc. 1883, p. 250, n. 4.

Male. Anterior wings above black, the cell, a large patch occupying the greater portion of the interspace between the lower median nervule and the submedian nervule, a smaller patch or subquadrate spot between the second and third median nervules,—sometimes divided or in other specimens only partially cleft,—two spots above this situate between the two upper median nervules, five or six subapical spots in curved series, a submarginal row of spots and a very indistinct and broken series of small marginal spots, pale bluish-grey and subhyaline. Posterior wings above pale subhyaline and bluish-grey, the costal area and the outer margin broadly castaneous, enclosing beyond the cell some pale spots and containing near anal angle two black pseudo scent-glands; neuriation blackish. Wings beneath as above, but the anterior wings with the ground colour of the apical area reddish-brown; posterior wings with two

\* Marsh. & de Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 52.

submarginal series of small pale spots. Head and thorax above blackish, spotted and streaked with whitish; abdomen olivaceous-brown. Head and thorax beneath and legs blackish, spotted and streaked with white, abdomen above fuscous; abdomen beneath olivaceous-brown, with a series of apical segmental whitish fasciæ.

Exp. wings, 82 to 115 millim.

HAB.—Continental India; Himalayan Region (Marsh. & de Nic.).—Tenasserim (Marsh. & de Nic.).—Malay Peninsula; Perak (Künst.—Calc. Mus.).—Formosa (Butl.).—Japan (Jonas—coll. Dist.); Nikko (Brit. Mus.).

There can be no question as to the variability of this species, and I here treat it accordingly, and do not follow Mr. Moore in giving distinctive names to the local forms. The form found at Perak is certainly not constant, as in two specimens in my own collection one has the large pale spot on the anterior wings between the second and third median nervules partially cleft, whilst the other has the spot completely divided (*specimen figured*).

According to Col. Lang it is a forest-loving insect, frequenting in the Western Himalayas wooded glens, at 6000 to 7000 feet altitude, with a high and soaring flight. In Kulu "it is not uncommon; it has four broods—the first brood appearing in April at the lower altitude; the second brood appears in June at about 6000 feet elevation; a third brood appears in August and the first week in September; and the fourth, which is much the smallest in numbers, appears late in October. It is strong on the wing and a high flier; the long pendant flowers of the hill *toon* (*Cedrela serrata*) are much affected by it" (A. Graham Young).\*

I am indebted to Dr. J. Anderson for my first knowledge of this species occurring in Perak, his fine collection made by Herr Künstler having been submitted to me for examination.

The systematic position of *D. tytia* is after *D. melaneus*.

### 9. *Danais abigar*. (Tab. XLII., fig. 11.)

*Idea Abigar*, Eschscholtz, Kotzeb. Reise, iii. p. 209, t. 7, f. 12 a, b (1821).

*Euptea chionippe*, Hübn. Samml. exot. Schmett. t. 6, f. 1, 4 (1806—1824).

*Danais cecilia*, Bougainv. Voy. Thétis, ii. p. 342, t. 44, f. 1 (1837).

*Salatura chionippe*, Moore, Proc. Zool. Soc. 1883, p. 243, n. 16.

*Anosia abigar*, Semp. Schmett. Phillip. Inseln. p. 17, n. 15 (1886).

Anterior wings above dark ochraceous; costal area, apical half, inner marginal area and the neuration dark fuscous; the outer fuscous area contains the following whitish spots:—one small costal spot near middle of costal margin and two above end of cell; six large spots in oblique series beyond end of cell, of which the upper five are only separated by the nervules and the lowermost is rounded and more detached; a few small apical spots, and a marginal and submarginal series commencing at upper median nervule. Posterior wings above whitish, the costal and outer marginal areas broadly dark fuscous, inwardly spotted and marked with castaneous; the costal dark area contains some whitish markings, and the outer dark area contains a marginal and a submarginal series of small whitish spots. Anterior wings beneath as above, but slightly paler, and with the marginal and submarginal series of spots continued to apex; posterior wings beneath as above, but paler. Head and thorax above dark fuscous, the head and anterior portion of thorax spotted with whitish; abdomen dark ochraceous, with a dorsal fuscous stripe; head and thorax beneath blackish, spotted with whitish; legs black, the femora streaked with whitish.

Exp. wings, 68 to 74 millim.

HAB.—Malay Peninsula; Province Wellesley (Birch—coll. Dist.).—Philippines; Manilla, Luzon (Moore).

\* Marsh. & de Nic. 'Butt. Ind. Burm. and Ceyl.' vol. i. p. 43.

The discovery of *D. abigar* in the Malay Peninsula is a most interesting fact in geographical distribution, as the species was generally considered as peculiar to the Philippine Islands.

The systematic position of *D. abigar* amongst the Malay Danaids is after *D. melanippus* var. *hegesippus*.

Genus EUPLŒA (*antea*, p. 21).

2. *Euplœa bremeri* (*antea*, p. 23).

Since writing the description of this butterfly, the male of which was then alone known to me, I have, through the kindness of Mr. L. de Nicéville, received some female examples captured by Capt. Bingham in Tenasserim. These Tenasserim females are paler and more olivaceous than my males from the Malay Peninsula, the markings are similar, and the discal spots equally variable.

One, and the smallest, of these Tenasserim females has been described by Mr. Moore as a distinct species, under the name of *Tronga olivacea*.\*

4. *Euplœa midamus* (*antea*, p. 24).

Mr. Moore has come to the conclusion that the description of *Papilio midamus* by Linnæus really applies to a Chinese species, and he has therefore renamed, as *Trepsichrois linnei*,† the widely spread butterfly which has hitherto been understood as *E. midamus*. I do not propose to alter the name here, as the species is at present so generally known as *E. midamus*, and has been thus referred to by so many authors that much inconvenience would arise by such transference of names, whilst, on the other hand, some authors might not accept Mr. Moore's conclusion.

7. *Euplœa vestigiata* (*antea*, p. 26).

*Salpinx lazulina*, Moore, Proc. Zool. Soc. 1883, p. 300, n. 3.

Mr. Moore has added what I consider as another name to the synonymy of *E. vestigiata*, which again is most probably but a variety of the Javan species *E. leucostictos*, Gmel.‡

9. *Euplœa crassa* (*antea*, p. 29.)

*Palemma apicalis*, Moore, Proc. Zool. Soc. 1883, p. 308, n. 15.

The view was here previously expressed that *E. crassa* was probably a variety of the *E. erichsoni*, Feld., and a long series of Felder's species, since acquired from Burma, strengthens that opinion. The experience of the writer is that both these species—if they are distinct—are very variable in markings, and therefore he can see no reason for Mr. Moore having given the Malay form the distinctive name of *P. apicalis*. If any alteration should be made it might be better to sink the name *E. crassa* under that of *E. erichsoni*, rather than to erect new species in a group which has already been made almost unintelligible by the specific treatment of varieties.§

\* Proc. Zool. Soc. 1883, p. 267, n. 5.

† Ibid. p. 286, n. 1.

‡ Syst. Nat. V. Ins. ii. p. 2289 (1789).

§ It is singular that when a so-called species is sought to be relegated to its proper varietal position in respect to some parent species, the greatest proof is desiderated by the analytical describer, who himself is constantly naming what other entomologists consider as varieties, without giving any reason whatever for the process.



17. *Euplœa harrisi*.

*Euplœa grotei* (antea, p. 36).

*Euplœa Harrisi*, Felder, Reise Nov. ii. p. 328, ♂ (1865).

*Stictopœa Harrisi*, Moore, Proc. Zool. Soc. 1883, p. 320, n. 4, t. xxx. f. 8, ♂.

Mr. Moore has discovered that the insect figured by Felder\* as his *E. grotei* is really the female of another species he had previously described as *E. harrisi*. The name of the Malay butterfly must therefore be altered as above.

18. *Euplœa marsdeni*. (Tab. XXXIX., fig. 1 ♂.)

*Tronga marsdeni*, Moore, Proc. Zool. Soc. 1883, p. 266, n. 3.

The following is Mr. Moore's description of this species:—

“Intermediate between *T. bremeri* and *T. crameri*.† Colour paler. Fore wing more the shape of that in *T. crameri*, being comparatively longer and narrower than in *T. bremeri*; the markings also are more like those in *T. crameri*, there being only two small upper submarginal spots, which, however, are more elongated and narrower, the next (or largest) spot is also much longer and narrower, the fourth smaller, and the lower three very small; the marginal row is distinct but very small; hind wings with two rows of small distinct white spots.”

Exp. wings, ♂, 98 millim.

HAB.—Malay Peninsula; Singapore (coll. Moore; Kerr—coll. Dist.).

I have given Mr. Moore's original description, because the species is evidently a variable one, as in two male specimens sent me, by Capt. Kerr, from Singapore, one (the specimen figured) possesses three small pale spots beyond the cell, and a very small spot in the cell, which are altogether absent in the second example.

I systematically place *E. marsdeni* as following *E. bremeri*.

Subfam. SATYRINÆ (antea, p. 37).—Genus MELANITIS (antea, p. 40).

1. *Melanitis leda* (antea, p. 41).

*M. determinata*, Butl. Ent. Month. Mag. vol. xxi. p. 246 (1885).

Mr. Butler states that “the true *M. leda* is a totally dissimilar Amboinese species,” and proposes the name *M. determinata* for the common Indian and Malay form of the species.

I do not agree with this course, firstly, because Mr. Butler himself does not seem clear as to what is the typical form, as, though he would now restrict that form to Amboinese examples, he has previously stated that he “found the small dark form (the true *P. Leda* of Linnæus) to be almost exclusively confined to India”;‡ and, secondly, because I possess Amboinese specimens of the species collected by Mr. Forbes, and find nothing but the gradual variation previously described by Mr. Butler himself in the paper referred to, thus proving his also previously expressed words, “I am fully convinced that this species is capable of almost any amount of variation in form as well as in colour.”§

It has been already stated (antea, p. 40) that *M. leda* and *M. ismene* have often been considered as varietal forms of one species. Mr. L. de Nicéville has subsequently informed us that *M. ismene* is but the dry-season form of *M. leda*,|| the species thus exhibiting seasonal

\* Reise Nov. Lep. ii. t. 41, f. 7.

† A Bornean species.

‡ “Observations on the Variation of *Cylla Leda*,” Ann. & Mag. Nat. Hist. ser. 3, vol. xix. p. 51 (1867).

§ Cat. Satyr. Brit. Mus. p. 2 (1868).

|| Proc. Ent. Soc. 1885, p. 11.

dimorphism or variation. Of course we await the recital of the experiments which will demonstrate this conclusion, and doubtless this will soon be afforded, for Mr. de Nicéville is a most careful lepidopterist. Meanwhile this proposed seasonal identity of the two forms is eminently reasonable and probable. It is therefore to be regretted that, awaiting these fuller particulars, Mr. de Nicéville's interesting and valuable theory should have been subjected by another writer to some jocose criticism,\* and the fact of the two forms having been found flying together does not prove that they entered the imago condition at the same time. Should this theory prove to be correct—and I certainly incline to the opinion that it will—a necessary qualification will be given to many of our specific views, and more benefit will be afforded to the study of Lepidoptera than by an annual contribution of the descriptions of three or four hundred so-called new species.

### 3. *Melanitis zitenius*. (Tab. XXXVIII., fig. 2, ♂.)

*Papilio Zitenius*, Herbst, *Naturs. Schmett.* vol. viii. p. 5, t. clxxxii. f. 1, 2 (1796).

*Melanitis ramana*, Horsf. & Moore, *Cat. Lep. Mus. E. I. C.* vol. i. p. 223, n. 463 (1857).

*Melanitis Ambasara*, Horsf. & Moore, *Cat. Lep. Mus. E. I. C.* vol. i. p. 223, n. 464 (1857).

*Melanitis Gnophodes*, *Butl. Cat. Satyr. Brit. Mus.* p. 5, n. 11, t. 2, f. 1 (1868).

*Melanitis zitenius*, Wood-Mas. & de Nic. *J. A. S. Beng.* vol. L. p. 244, n. 9 (1881); Marsh. & de Nic. *Butt. Ind. Burm. & Ceyl.* vol. i. p. 258, n. 251 (1882).

Male. Wings above fuliginous-brown; anterior wings with a fuscous oblique patch at end of cell, followed by a subapical ochraceous subquadrate spot, beneath which is a very small spot of the same colour; posterior wings with two small whitish submarginal spots separated by the second median nervule. Wings beneath brownish-ochraceous, much mottled with small darker strigæ; anterior wings with a dark oblique fascia almost crossing wing beyond end of cell, two small subapical greyish-white spots, and some similar and very indistinct spots placed between the nervules near outer margin; posterior wings with a discal curved dark fascia crossing wing beyond end of cell, and some submarginal small and obscure greyish spots as on anterior wings; outer margins of both wings warmer ochraceous. Body and legs more or less concolorous with wings.

Exp. wings, 73 to 78 milim.

HAB.—Continental India; East Himalaya, Khasi Hills (Marsh. & de Nic.).—Andaman Islands (de Rœpstorff—*Calc. Mus.*).—Burma (Marsh. & de Nic.).—Tenasserim (Bingham—*Calc. Mus.*).—Malay Peninsula; Perak (Künst.—*Calc. Mus.*).—Sumatra (Forbes—*coll. Dist.*).—Java (Horsf. & Moore).

A male specimen captured in Perak, and now contained in the Calcutta Museum, is here figured. The female is larger and paler in hue than the male, and the under surface of the wings is more ochraceous and less prominently mottled with the dark strigæ.

### 4. *Melanitis suyudana*. (Tab. XXXIX., fig. 2.)

*Melanitis Suyudana*, Moore (Horsf. & Moore), *Cat. Lep. Mus. E. I. C.* vol. i. p. 224, n. 466 (1857).

*Melanitis Asua*, Marsh. & de Nic. (part), *Butt. Ind., Burm. & Ceyl.* vol. i. p. 251, n. 244.

The following is Mr. Moore's original description:—

“Upper side deep dark brown, paler on the margins: a single whitish spot near apex of *fore-wing*, and a minute dot on *hind-wing*. Underside deep mottled ferruginous-brown, with indistinct dark usually

\* *Ent. Month. Mag.* vol. xxi. p. 246.

transverse streaks; a triangular space of mottled greyish-white from costal margin near the apex; *hind-wing* with six small pale spots centred with a white dot."

Exp. wings, 67 to 75 millim.

HAB.—Malay Peninsula; Perak (Künst.—coll. Semper).—Java (Horsf. & Moore); Bantam (coll. Dist.).

I am indebted to Herr Georg Semper for the opportunity of examining and figuring a Perak specimen of this species. Messrs. Marshall and de Nicéville treat *M. suyudana* as conspecific with *M. aswa*, Moore, and *M. tristis*, Feld.,\* or rather estimate the three forms as varieties of one species. I possess Javan and therefore typical examples of *M. suyudana*, with which the Perak specimen figured exactly agrees, and I think it is sufficiently distinct to stand alone.

### 5. *Melanitis abdullæ*. (Tab. XIX., fig. 3.)

*Melanitis abdullæ*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 241 (1883).

Wings above dark fuliginous-brown, somewhat paler at outer margins. Wings beneath ochraceous, thickly mottled with brown; anterior wings with two broad and irregular dark fasciæ crossing cell and wing, some irregular waved markings beyond cell, and some small and indistinct ocellated spots placed in irregular series on outer discal area, of which the most distinct are two separated by the upper discoidal nervule, and two separated by the second median nervule; posterior wings with a narrow dark fascia passing a little beyond end of cell, beyond which the colour is uniformly darker and more opaque, and on which is included a series of six submarginal ocellated spots placed between the nervules, of which the second (situate above the discoidal nervule) and the sixth (placed near the anal angle) are somewhat the smallest. Body and legs more or less concolorous with wings.

Exp. wings, 63 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.).

My collection contains but a single specimen of this species, and I have not met with it in any of the numerous and large consignments from Perak, of which opportunity for examination has been afforded.

### Genus LETHE (*antea*, p. 43).

### 2. *Lethe mekara*. (Tab. XXXIX., fig. 9 ♂.)

*Debis Mekara*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. vol. i. p. 219, n. 454 (1857).

*Lethe Mekara*, Butl. Cat. Satyr. Brit. Mus. p. 119, n. 32 (1868); Moore, Proc. Zool. Soc. 1878, p. 824; Marsh. & de Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 148, n. 132 (1882).

Male. Wings above fuliginous-brown; posterior wings with four submarginal blackish spots surrounded by dull red, and sometimes with a fifth subapical black spot as in the specimen figured. Wings beneath pale olivaceous-brown; the disks of both wings crossed by two narrow castaneous fasciæ, the first straightest, crossing cells, and on anterior wings having a short additional branch from median to subcostal nervures, the second waved—particularly on the posterior wing—and crossing wings beyond cells, the inner fascia is outwardly margined with greyish-white, and on posterior wings the lower discoidal nervule is also shaded with castaneous; beyond the outer fascia the colour is paler, more violaceous, and inclining to ochraceous at outer margin, and containing on anterior wings five submarginal ocellated spots placed between the nervules (a sixth apical spot is only denoted by a dark central spot), and on posterior wings six ocellated spots, the uppermost largest and well separated from the rest which are more or less contiguous. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 63 millim.

\* Two species described from Continental India.

HAB.—Continental India; Sikkim, Sibsagar (Marsh. & de Nic.).—Tenasserim; Ahsown, Taoo (Limborg—Moore).—Malay Peninsula; Perak (Künst.—Calc. Mus.).—Malacca (Godfery—coll. Dist.).

Some examples from the Malay Peninsula, by the presence of the fifth marginal spot to the upper surface of the posterior wings, approach the Javan form described by Felder under the name of *L. manthara*,\* but other specimens from the same locality exhibit only the four normal spots. The female is figured by Messrs. Marshall and de Nicéville, † and as described by those authors differs principally from the male on the upper surface of the anterior wings, which are “crossed beyond the cell by an angulate macular white band, consisting of a short oblique bar from the costa to third ‡ median nervule, below which are two triangular spots directed inwards, one on each median interspace; a subapical bifid white spot near the costa.”

According to the experience of Capt. Godfery, this species in Malacca “frequents dark shady places, passing the day at the foot of a tuft of bamboo, or on low shrubs under shady trees. When disturbed it goes off with a rapid flight, soon settling again, however, unless it has been several times alarmed.”

### 3. *Lethe minerva*. (Tab. XXXVI., fig. 8 ♂.)

*Papilio Minerva*, Fabricius, Syst. Ent. p. 493, n. 216 (1775); Sp. Ins. p. 74, n. 327 (1781); Mant. Ins. p. 37, n. 383 (1787); Ent. Syst. iii. p. 95, n. 295 (1793).

*Papilio Arcadia*, Cram. Pap. Ex. ii. t. 116, E, F (1779).

*Temenis Arcadia*, Hübn. Verz. bek. Schmett. p. 34, n. 279 (1816).

♂ *Satyrus Caumas*, Godt. Enc. Méth. ix. p. 479, n. 7 (1823).

*Debis Arcadia*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 219, n. 453 (1857).

*Lethe Arcadia*, Butl. Cat. Satyr. Brit. Mus. p. 118, n. 24 (1868); Moore, Proc. Zool. Soc. 1878, p. 824.

*Lethe Minerva*, Butl. Cat. Fabr. Lep. p. 29, n. 4 (1869); Marsh. & de Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 122 (1882).

Male. Wings above dark brown; anterior wings with a sexual patch of differently formed scales near the centre of the submedian nervure and surrounded by blackish hairs; posterior wings with the outer margin reddish ochraceous, and with an outer discal patch of the same colour, on which are situate three dark spots separated by the two upper median nervules, a glandular patch of blackish hairs beneath cell and between the two lower median nervules; abdominal area somewhat paler in hue and clothed with long hairs. Wings beneath pale violaceous-brown, both wings crossed by two narrow castaneous fasciæ, the first nearly straight crossing cells and commencing at subcostal nervure of anterior wings and angularly terminating near submedian nervure of posterior wings, the outer fascia much waved and deeply angulated on posterior wings, between this fascia and outer margin there are on anterior wings three or four subobsolete ocellated spots placed between the nervules, and on the posterior wings there are six ocellated spots—the lowermost bifid—the centres of which are ochraceous dusted with blackish and broadly surrounded by warm ochraceous; a submarginal castaneous fascia to both wings, and the margins reddish ochraceous with an inner black line; the anterior wings have a short oblique broken fascia in cell and the lower disco-cellular nervule of the posterior wings is also shaded with castaneous. Body above and beneath more or less concolorous with wings; legs dark ochraceous.

Exp. wings, 56 millim.

HAB.—Tenasserim; Ahsown (Limborg—Moore).—Malay Peninsula; Perak (Künst.—Calc. Mus.).—Sumatra (Smith). §—Java (Horsf. & Moore).

\* Reise Nov. Lep. iii. p. 497, n. 861.

† Butt. Ind., Burm. & Ceylon, vol. i. t. xi. f. 24.

‡ Upper median nervule of Messrs. Marshall & de Nicéville's arrangement.

§ In Bock, 'Head Hunters of Borneo,' Appendix V.

This species does not appear to be scarce in Tenasserim, as Messrs. Marshall and de Nicéville report that "Capt. Bingham took the species in the Donat Range and Meplay in January, at Meplay in January and February, in the Thoungyeen Forests in March and May, and at Houndraw in November; and Limborg took it at Ahsown, probably in the cold weather."\*

The only example I have seen from the Malay Peninsula is the male specimen here figured, belonging to Dr. J. Anderson, and destined for the collection of the Calcutta Museum.

Genus CÆLITES (*antea*, p. 45).

2. *Cærites epiminthia*. (Tab. XIX., fig. 8.)

*Cærites Epiminthia*, Westwood (Doubl. & Hew.), Gen. Diurn. Lep. p. 368, n. 2, *note* (1851); Butl. Cat. Satyr. Brit. Mus. pp. 111, 112 (1868); Druce, Proc. Zool. Soc. 1873, p. 339, n. 1.

Wings above violaceous-blue; anterior wings with the base, costal area, the apex and outer margin pale brown; posterior wings with the base, costal area and outer margin pale brown. Wings beneath pale brown, a greyish-violaceous fascia crossing both wings near apices of cells, and the apices and outer margins broadly of the same colour; this pale coloration on the anterior wings possesses four or five obscure ocellated spots placed between the nervules, of which two near the apex are the most prominent; posterior wings with five ocellated spots placed between the nervules, of which the third is smallest; two narrow dark violaceous submarginal lines to both wings and the margins narrowly of the same colour. Body above pale brown; body beneath and legs pale brown.

Exp. wings, 68 to 70 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.).—Sumatra (Butl.).—Borneo (Westw. and Druce).

Messrs. Marshall and de Nicéville have evidently misunderstood this species, and not Mr. Butler, as they conclude.† The anterior wings do possess ocellated spots beneath, which Prof. Westwood did not describe—they are sometimes almost obsolete—and they were found present in all the Bornean examples which I have examined.

Genus NEORINA (*to follow* CÆLITES).

*Neorina*, Westwood, Gen. Diurn. Lep. p. 369 (1851); Marsh. & de Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 133 (1882).

This genus as arranged systematically with other genera of *Satyridæ* belonging to the Malay Peninsula is related to *Cærites*, agreeing with that genus in the common characters of having the median nervules of the anterior wings widely separated, the first and second median nervules of the posterior wings having a common origin at apex of cell, and the lower disco-cellular nervule of posterior wings distinctly longer than the upper one. It, however, differs from *Cærites* in having the costal nervule of the anterior wings only dilated in a scarcely perceptible manner, and the lower disco-cellular nervule of the anterior wings is strongly and concavely bent inwardly towards the lower discoidal nervule. The species of *Neorina* are also noticeable by their large size and the well-developed caudate prolongation of the posterior wings.

*Neorina*, as at present understood, is a small genus, and its species are confined to Continental India and the true Indo-Malayan region.

\* Butt. Ind., Burm. & Ceyl. vol. i. p. 141.

† Ibid. p. 102.

1. *Neorina lowii*, var. (Tab. XXXVII., fig. 3.)

*Cyllo Lowii*, Doubleday & Hewitson, Gen. Diurn. Lep. p. 369, t. 61, f. 4 (1851).

*Neorina Lowii*, Butl. Cat. Satyr. Brit. Mus. p. 111, n. 3 (1868); Druce, Proc. Zool. Soc. 1873, p. 339, n. 1; Kheil, Rhop. der Ins. Nias, p. 19, n. 23 (1884).

Male and Female. Wings above dark fuscous-brown; anterior wings with the outer margin paler and traversed by a dark submarginal line, and with a large ocellated spot near apex, a submarginal series of four small whitish spots,—five if the centre of the ocellated spot is counted,—an apical white marginal spot, and a very pale stramineous patch on inner margin near outer angle; posterior wings with a large and very pale stramineous patch at apex, which extends inwardly to near upper median nervule, an ocellated spot between the second and third median nervules, and often a small white spot between the first and second median nervules,—not present on the specimen figured,—two dark submarginal lines, and fringe greyish-white. Wings beneath as above, but somewhat paler; anterior wings with the area beyond the spots more or less violaceous, and with two dark submarginal lines; posterior wings as above, but with an ocellated spot between the subcostal nervules and the pale stramineous patch above, smaller, paler and broken beneath, the abdominal and anal-angular areas more or less dusted with greyish, and with a sublunate greyish spot at anal angle. Body and legs more or less concolorous with wings.

Exp. wings, ♂ & ♀, 98 to 102 millim.

HAB.—Malay Peninsula; Perak (Künstler—colls. Semper & Calc. Mus.).—Nias Island (Kheil).—Sumatra (Forbes—coll. Dist.).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).

Malay (and also Sumatran) specimens of this species slightly vary from Bornean examples by having the apical pale patch on the under surface of the posterior wings more or less broken, but whoever studies the fauna of the Malay Peninsula together with that of Sumatra and Borneo will find much specific variation of this character.

Genus MYCALESIS (*antea*, p. 47).2. *Mycalesis orseis* (*antea*, p. 49).

Since writing the description of the above, when a single specimen in the Hewitsonian collection from Singapore was the only record of the species from the Malay Peninsula, I have received several specimens, and the following locality can be added:—

*Sungei Ujong* (Durnford—coll. Dist.).

8. *Mycalesis anaxias*. (Tab. XXXVI., fig. 7.)

*Mycalesis anaxias*, Hewitson, Ex. Butt. iii. *Myc.* t. 4, f. 25, 26 (1862); Butl. Cat. Satyr. Brit. Mus. p. 141, n. 59 (1868); Moore, Proc. Zool. Soc. 1878, p. 825; Marsh. & de Nic. Butt. Ind., Burm. & Ceyl, vol. i. p. 106, n. 86, t. xvi. f. 54 (1882).

*Virapa anaxias*, Moore, Trans. Ent. Soc. 1880, p. 156.

The following is Mr. Hewitson's original description of this species:—

“Upperside.—Male brown; anterior wing crossed near the apex by an oblique band of white.”

“Underside dark brown from the base to beyond the middle (its border on the anterior wing angular), followed by a broad margin clouded with lilac and grey, and rufous-brown: traversed by three lines of dark brown; the cilia lilac; anterior wing with the white band as above, and three small ocelli, two above, one below the band; posterior wings with five ocelli;\* all black, with white pupils, the iris rufous, and indistinct.”

\* Sometimes seven as in specimen figured.

Exp. wings, 45 millim.

HAB.—Continental India; Nilgiris, Trevandrum, Travancore, Sikkim, Assam, Khasi Hills (Marsh. and de Nic.).—Tenasserim; Ahsohn, Moolai (Limborg—Moore).—Malay Peninsula; Perak (Künst.—Calc. Mus.).

This species is subject to considerable variation, and Messrs. Marshall and de Nicéville, who have examined long series of specimens, have fully described the same; they also write, "The female differs from the male in its larger size, broader and more rounded forewing, and paler coloration, in consequence of which the ocelli of the underside not unfrequently show through on the upperside."

The figure is taken from a single specimen contained in a Perak collection placed in my hands by Dr. J. Anderson, and I have seen a second specimen in the collection of Messrs. Birch and Egerton, now exhibited in the Colonial Exhibition.

This species should here precede *M. maiancas*, and thus be placed at the beginning of the genus.

#### 9. *Mycalesis nautilus*. (Tab. XL., fig. 4 ♂.)

*Mycalesis Nautilus*, Butler, Ann. & Mag. Nat. Hist. ser. iii. vol. xx. p. 403, t. 9, f. 7 (1867); Cat. Satyr. Brit. Mus. p. 136, n. 39 (1868).

*Calysime Nautilus*, Moore, Trans. Ent. Soc. 1880, p. 162.

Male. Wings above fuscous-brown; anterior wings with a broad paler submarginal fascia on which are five ocellated spots divided by the nervules, the lowest largest and situate between the two lower median nervules, three narrow marginal fasciæ, the innermost waved; posterior wings with fasciæ as on anterior wings, two obscure ocellated spots near apex and with a large glandular patch of silky dark indigo scales situate on the median nervules. Wings beneath much paler than above, two narrow dark discal fasciæ, the outermost margined with pale violaceous; anterior wings with ocellated spots as above, but paler and larger; posterior wings with a series of seven ocellated spots placed between the nervules, the fourth and fifth largest; the spots on both wings are inwardly narrowly and sinuately margined with pale greyish. Body above and beneath with legs more or less concolorous with wings.

Female. Wings above much paler than in male; posterior wings with the spots beneath obsoletely visible above,\* and the dark silky patch absent. Wings beneath as in male.

Exp. wings, ♂ and ♀, 48 to 49 millim.

HAB.—Malay Peninsula; Perak (Künst.—Calc. Mus. & coll. Dist.); Malacca (coll. Roberts).

Attention has already been drawn to this species (*antea*, p. 55), and it has recently been received freely from Perak, where evidently it is not a rare species.

In this enumeration it should follow *M. mineus*.

#### 10. *Mycalesis mnasicles*. (Tab. XXXVII., fig. 5), *var.*

*Mycalesis Mnasicles*, Hewitson, Ex. Butt. iii. *Myc.* t. 5, f. 32, 33 (1864); Butl. Cat. Satyr. Brit. Mus. p. 141, n. 63 (1868); Druce, Proc. Zool. Soc. 1873, p. 339, n. 4; Marsh. & de Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 126, t. 16, f. 51 (1882).

*Culapa Mnasicles*, Moore, Proc. Zool. Soc. 1878, p. 825; Trans. Ent. Soc. 1880, p. 165.

\* Mr. Butler in his original description states that "the sexes differ only in size"; it is therefore probable that he had not seen both of them.

The following is Mr. Hewitson's original description:—

“Upperside. Male rufous brown; both wings with a submarginal black line. Anterior wing with two ocelli, one at the apex minute, the other below the middle, very large. Posterior wing with one indistinct ocellus and a submarginal band of indistinct lunular spots.”

“Underside with the basal half rufous; both wings crossed before the middle, and at the middle by common rufous-brown narrow bands: both with two black lines near the outer margin and a submarginal zigzag rufous band. Anterior wing with five ocelli, the first four minute, the fifth larger, and marked with a large white pupil. Posterior wing with seven small ocelli, the first and fifth the largest.”

“Female does not differ except in size.”

Exp. wings, ♂, 65 millim.

HAB.—Tenasserim; Alisown, Meetan (Limborg—Moore).—Malay Peninsula; Perak (coll. Godfery; Künst.—Calc. Mus.).—Sumatra (coll. Hewits.).—Borneo (Druce).

The specimen figured is a pale variety captured by Capt. Godfery in Perak, and I have seen similar examples of the species from Tenasserim. However, this variety is not constant in Perak, as specimens have recently passed through my hands which perfectly agreed with Hewitson's figure.

*M. muasicles* should be here arranged after *M. blasius*.

#### 11. *Mycalesis anapita*. (Tab. XXXIX., fig. 8.)

*Mycalesis Anapita*, Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 232, n. 495 (1857); Butl. Cat. Satyr. Brit. Mus. p. 146, n. 85 (1868); Druce, Proc. Zool. Soc. 1873, p. 339, n. 6.

*Mydosama Anapita*, Moore, Trans. Ent. Soc. 1880, p. 171.

Male and Female. Wings above reddish-ochraceous, basal areas darker; anterior wings with the costal, apical and outer margins broadly fuscous, and the outer third of inner margin also of the same colour and with a large ocellated spot containing a white centre situate between the two lower median nervules; posterior wings with a submarginal series of five ocellated spots, the two largest being separated by the second median nervule, three marginal fuscous linear fasciæ, the innermost broadest. Wings beneath paler ochraceous than above, both wings crossed by two narrow castaneous fasciæ; anterior wings with a large ocellated spot as above, and two small and united ocellated spots near apex (in some specimens the large spot has a smaller one beneath it); posterior wings beneath with a submarginal series of seven ocellated spots, the three uppermost smallest, the spots on both wings preceded by a pale waved castaneous fascia; both wings with one submarginal and two marginal dark lines. Body above pale brown, beneath with legs more or less concolorous with wings; legs more or less shaded with fuscous.

Exp. wings, ♂ and ♀, 40 to 45 millim.

HAB.—Malay Peninsula; Selangor—Klang (coll. Godfery); Sungei Ujong (Durnford—coll. Dist.).—Sumatra (Moore).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).

This species, though seemingly scarce in the Malay Peninsula, has been found abundant in North Borneo by Mr. Pryer. It has not been recorded from Tenasserim, and does not appear to occur above the limits of our fauna.

*M. anapita* is allied to *M. fusca*.

#### 12. *Mycalesis ustulata*. (Tab. XLI., fig. 16 ♂.)

*Mycalesis ustulata*, Distant, Entomologist, vol. xviii. p. 289 (1885).

Male. Wings above bright rufous-brown; anterior wings with the apex and outer margin broadly infuscated, and with a moderately-sized dark fuscous ocellated spot—having a minute greyish centre and a



pale rufous outer margin—situate between the two lower median nervules; posterior wings having the costal and outer margins somewhat broadly infuscated, and the male with a costal tuft of pale ochraceous hairs near base. Wings beneath fuscous; a dark waved and obscure narrow linear fascia crossing cell of anterior wings, and two similar ones crossing cell of posterior wings; both wings crossed beyond middle by a violaceous fascia, beyond which on anterior wings are two large ocellated spots, the uppermost smallest, both blackish, with white centres and narrow ochraceous outer margins, which are again surrounded by an outer pale waved marginal ring; these outer rings approach one another, and at their prolongations each contains an additional minute and obscure greyish spot; posterior wings with seven ocellated spots as on anterior wings, the fifth largest, the sixth and seventh contained in one encircling ring, and a more minute and much more obscure spot above anal angle; both wings with three narrow marginal pale fasciæ, the outermost fringe-like, the innermost broadest and scalloped. Body and legs more or less concolorous with wings.

Exp. wings, 48 millim.

HAB.—Malay Peninsula; Perak (Künst.—coll. Ribbe).

This is another novelty captured by Künstler in the Perak district, and is in the collection of Herr Ribbe, of Dresden, who forwarded it to me for determination. It belongs to the section of the genus which has been generically separated by Mr. Moore under the name of *Loesa*. It is intermediate in form between the Javan *M. oroatis*, Hew., and the *M. surkha*, Marsh., found in Upper Tenasserim.

#### Genus YPTHIMA (*antea*, p. 55).

##### 1. *Ypthima pandocus* var. *corticaria*.

*Ypthima corticaria*, *antea*, p. 55.

*Ypthima Pandocus*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. vol. i. p. 235, n. 506 (1857); Hew. Trans. Ent. Soc. ser. 3, vol. ii. p. 290, n. 16, t. 18, f. 12 (1865); Butl. Cat. Satyr. Brit. Mus. p. 149, n. 5 (1868); Marsh. & de Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 223, n. 211 (1882).

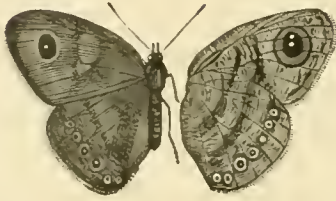
Since enumerating the above species under the name proposed by Mr. Butler I have received long series of both typical *Y. pandocus* from Java, and the form *Y. corticaria* from the Malay Peninsula. The difference between the Malay and Javan specimens is simply that the former have the under surface of the wings, and particularly the basal half of the anterior wings, *paler* than in the typical form of the species as found in Java and Borneo. I have therefore now placed the *Y. corticaria* as a simple variety or local form of *Y. pandocus*.

To the former habitats given may be added—

Malay Peninsula; Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Singapore (Kerr—coll. Dist.).

##### 2. *Ypthima methora* (*antea*, p. 56).

Mr. L. de Nicéville has communicated his opinion to me that the species thus identified by Mr. Butler, and enumerated as such by myself in this work, is not typical *Y. methora*, Hew., which is a larger insect and confined to Northern India and Upper Burma. As I have not received a specimen myself from the Malay Peninsula, and only know it by the example from Malacca in the British Museum (which agrees with Hewitson's figure in markings, though not in size), it is better to leave it under this name, subject of course to a further series of specimens proving its varietal or distinct character. ?

5. *Ypthima fasciata*, var.FIG. 122.—*Ypthima fasciata*.

*Ypthima fasciata*, Hewitson, Trans. Ent. Soc. ser. 3, vol. ii. p. 287, n. 12 (1865); Druce, Proc. Zool. Soc. 1873, p. 340, n. 2.

The following is Mr. Hewitson's original description:—

“Upperside brown. Both wings undulated with grey, chiefly beyond the middle; both crossed at the middle by a common band of darker colour, the margins dark brown. Anterior wing with one large bipupillated ocellus; posterior wing with five or six obscurely marked upon a band of rufous-brown.”

“Underside grey, beautifully undulated throughout with rufous-brown; both wings crossed by two bands of darker colour. Anterior wing with the ocellus as above, but more distinct; posterior wing with seven small ocelli of nearly equal size, placed as above upon a band of rufous-brown, all black, the pupils silver, the irides orange-yellow.”

Exp. wings, 38 to 40 millim.

HAB.—Malay Peninsula; Perak (coll. Dist.).—Sumatra (Hewitson).—Borneo; Sarawak (Wall.—coll. Dist.); Sandakan (Pryer—coll. Dist.).

The Perak specimen here figured only differs from typical Bornean examples by the somewhat paler hue of the under surface of the wings. It thus bears the same relationship to the Bornean type as the Javan *Y. pandocus* exhibits to the Malay var. *corticaria*.

## Genus RAGADIA (to follow YPTHIMA).

*Neonympha*, subgenus *Ragadia*, Westwood, Gen. Diurn. Lep. p. 376 (1851); Marsh. & de Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 234 (1882).

This genus is allied to *Ypthima*, from which it may be at once synoptically separated by the very short and acute discoidal cell to the posterior wings. In *Ragadia* the costal nervure of the anterior wings is strongly swollen at the base, the first subcostal nervule of the anterior wings is alone emitted before the end of the cell as in *Ypthima*: the disco-cellular nervules concave, the lowermost longest; discoidal cell of the posterior wings very short and acute, the lower disco-cellular nervule apparently emitted from the subcostal nervure, and joining the median nervure near the base of the lower median nervule; this nervule is simple in the female, but in the male is developed into a narrow glandular pouch.

Of this very distinct and somewhat aberrant genus two species are known, one of which appears to be confined to Northern India, Burma and Tenasserim, and the second, found in this fauna, is also distributed through some of the islands of the Malayan Archipelago, and in the Philippines diverges into several distinct forms, which have been estimated by different lepidopterists as either varieties or distinct species.

1. *Ragadia crisia*. (Tab. XIX., fig. 7).

*Euptychia Crisia*, Hübner, Zutr. Ex. Schmett. f. 675, 676 (1832).

*Neonympha (Ragadia) Crisia*, Westw. Gen. Diurn. Lep. p. 376, n. 26 (1851).

*Hipparchia Makuta*, Horsf. Cap. Lep. E. I. C. t. 5, f. 9, 9a (1829).

*Ragadia Makuta*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 226, n. 473 (1857).

*Ragadia Crisia*, Bntl. Cat. Satyr. Brit. Mus. p. 158, n. 1 (1868); Druce, Proc. Zool. Soc. 1873, p. 339, n. 1.

Male and Female. Wings above pale greyish-brown; anterior wings crossed by three oblique dark fasciæ,—the one at base short and obscure,—a submarginal fascia of the same colour enclosing a series of

seven obscure ocellated spots, the uppermost small and the lowermost duplex, and a narrow marginal fascia. Posterior wings with three oblique fasciæ; beyond the third is a series of six obscure ocellated spots, of which the uppermost is smallest and the lowermost duplex, and a narrow submarginal and a rather broader marginal fascia of the same colour. Wings beneath pale ochraceous, the fasciæ darker, and the ocellated spots with bright silvery centres. Body above greyish-brown, beneath with legs pale ochraceous; thorax and legs streaked with greyish-brown.

Exp. wings, ♂ & ♀, 36 to 46 millim.

HAB.—Malay Peninsula; Penang, Province Wellesley (coll. Dist.); Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca, Singapore (Godfery).—Sumatra (Forbes—coll. Dist.).—Java; Bantam (coll. Dist.).—Borneo (Druce); Sarawak (Wallace—coll. Dist.); Sandakan (Pryer—coll. Dist.).

This species varies in hue above, and of a long series in my own collection the palest specimen is from Sumatra and the darkest from Perak.

One of the most peculiar facts in relation to this butterfly appears to be its almost recent appearance in the Malay Peninsula, or at all events its first capture there by collectors. I did not meet with it myself when collecting at Province Wellesley, nor did I subsequently receive it in numerous collections derived from the Peninsula. In 1883, however, the species seems to have been common from Penang to Singapore. I first received two specimens captured on Penang Hill, and sent to me as a new species; others shortly followed from Province Wellesley, with the remark of an experienced collector that the species was quite new to the locality; and almost simultaneously the Indian Mail brought me more examples from Sungei Ujong, Malacca, and Singapore. My friend Mr. Logan also sent me an example with the comment, "a very rare butterfly, not known to collectors here."\*

Capt. Godfery, who also captured the species at Sungei Ujong, describes it as being found "in low undergrowth in the forest, where, especially in the early morning, I several times met with it. Its flight is weak and feeble, but it cleverly eludes pursuit by threading its way through the tangled brushwood."

#### Genus ELYMNIAS (*antea*, p. 58).

##### 8. *Elymnia abrisa*.<sup>\*</sup> (Tab. XLIII., fig. 5 ♂.)

*Elymnia abrisa*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xvii. p. 531 (1886).

Male. Wings above dark obscure indigo-blue, posterior wings with a large submarginal pale bluish patch. Wings beneath glossy brownish, much mottled with paler strigæ; anterior wings with the basal half of costal area and apical margin castaneous, and with a large triangular pale subapical patch; posterior wings with a subcostal castaneous patch, a pale stramineous spot between the subcostal nervules, and the outer half of wing with the ground-colour pale violaceous and having a few small submarginal spots. Body and legs more or less concolorous with wings.

Female. † "Wings dentated, the hind wings most strongly, brown with a slight blush shade. Fore wings with a large whitish patch, commencing above the submedian nervure at half the length of the cell, to beyond the discoidal nervule; below the submedian nervure it extends obliquely outwards to the level

\* In England the plentiful appearance of some hitherto rare insect frequently gives the character to an entomological year, and the above facts show that this spasmodic appearance is exhibited by certain species in the tropics.

† I am indebted to Mr. W. F. Kirby for furnishing me with the above description of the female of this species, which I found contained (unnamed) in the Hewitsonian collection.

of the internal nervure, which, however, it does not pass, nor does it reach the hind margin, which it approaches nearest above the anal angle. There is also a white band running obliquely across the tip from beyond the middle of the costa to beyond the submedian nervure, which divides it; but this also does not reach the wing margin. Hind wings white, with a broad border of the bluish-brown ground colour, not sharply defined on the inner side. Underside brown, thickly mottled with pinkish-white, especially on the portions corresponding to the white parts of the upper surface. A little below the costa, just above the discoidal nervule, is a large slightly oval primrose-coloured spot, slightly paler round the edges."

Exp. wings, ♂, 70 millim.

HAB.—Malay Peninsula; Province Wellesley (coll. Dist.)

*E. abrisa* is allied to the Sumatran species *E. sumatrana*, Wall., from which it differs by the pale patch on the upper surface of the posterior wings, and by the subcostal stramineous spot beneath. It is therefore also allied to *E. penanga*, after which species I place it in this enumeration.

An unlocalised and unidentified specimen in the Hewitsonian collection is clearly the female (described above) of this species, and also differs strongly from the corresponding sex of *E. sumatrana*.

### 9. *Elymnias künstleri*. (Tab. XLI., fig. 9 ♂.)

*Elymnias Künstleri*, Honrath, Berl. Entomol. Zeitschr. Bd. xxix. Heft 11, p. 276, t. viii. f. 3 (1885).

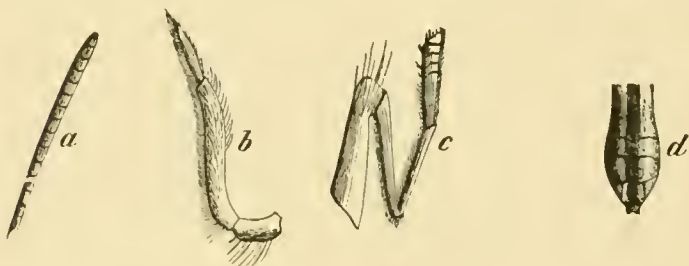


FIG. 123.—a, antenna; b, palpus; c, anterior leg; d, abdomen.

Female. Wings above greyish-white; anterior wings with bluish reflections in cell and pale ochraceous shadings on inner marginal area. Costal area more or less spotted and marked with blackish, thickly so to end of cell, and some similar markings in cell along the median nervure, nervules ornamented with fuscous and blackish blotches—the three median nervules and the lower discoidal nervule most prominently so; posterior wings with the basal and abdominal areas more or less shaded with pale ochraceous, neuration with black and fuscous blotches as on anterior wings, but less prominent, a blackish spot uniting the discoidal and upper median nervules; a submarginal series of irregularly shaped blackish spots, between which and posterior margin are many fuscous and black irregularly shaped and placed linear spots. Anterior wings as above, but more uniformly greyish, the shadings along neuration much more broken and unrelieved by fuscous-brown, several curved black lines crossing cell; posterior wings generally as above.

Exp. wings, 101 millim.

HAB.—Malay Peninsula; Perak (Künstler—coll. Honrath).

I am indebted to Herr Honrath for a very careful and beautiful drawing of this species, which is here reproduced, and also for the loan of the blocks showing illustrations of the antenna, palpus, anterior leg, and abdomen.

As far as can be gathered from an examination of the neuration in the drawing, this species is a true *Elymnias*, and is one of the most interesting and beautiful additions to our knowledge of the genus.

10. *Elymnias godferyi*. (Tab. XXXIX., fig. 5 ♀.)

*Elymnias Godferyi*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 351 (1883).

Female. Allied to *E. vasudeva*, Moore,\* but differing above by the much paler colouring of the wings, the fuscous shadings in the Indian species being replaced by bluish; the anterior wings are greyish-white, shaded with bluish, which become darker beyond the cell; a broad outer marginal dull bluish black fascia, widest at apex; nervures and nervules dark bluish, the median nervules and submedian nervure more or less margined with dark bluish; posterior wings as in *E. vasudeva*, but the markings bluish and the outer margin very broad at anal angle. Wings beneath as in *E. vasudeva*, but the dark mottled markings much smaller and closer together; anterior wings with two small submarginal ocellated spots (black with greyish centres), divided by the lower discoidal nervule; posterior wings with eight similar submarginal spots, the two uppermost largest, the first between and near the bases of the subcostal nervules, the second above the discoidal nervule, and the remaining spots following regularly between the nervules—two between the lower median nervule and submedian nervure; the red basal colouring of the posterior wings occupies the largest portion of the cell, and extends to the base of the abdominal margin; the yellow space does not extend from the abdominal margin to the upper median nervule, as in *P. vasudeva*, but terminates suddenly at the second median nervule.

Exp. wings, ♂, 53 millim.; ♀, 70 millim.

HAB.—Malay Peninsula; Sungei Ujong (Godfery—coll. Dist.).—Borneo; Sandakan (Pryer—coll. Dist.).

Since describing this species, from a female specimen sent home by Capt. Godfery, I have examined male specimens which were captured in North Borneo by Mr. Pryer. These differ from the female by their smaller size, their darker colouring above, and by the smaller and less vivid expanse of the red and yellow shadings to the under surface of the posterior wings.

Capt. Godfery caught the species "hovering with somewhat feeble flight over the high banks separating the road from the adjacent forest."

Subfam. NYMPHALINÆ.—Group MORPHINA (*antea*, p. 67).

Genus AMATHUSIA (*antea*, p. 70).

1. *Amathusia phidippus* (*antea*, p. 70).

Several specimens of a variety of this species have been sent home by Herr Künstler from Perak, in which on the under surface of the wings the outer dark fascia is—on the anterior wings—somewhat narrowed and its outer margin broken and scalloped; the basal dark fasciæ are also narrowed, and therefore appear further apart.†

Typical examples of the species are also plentiful in Perak, and I can find no reliable character to differentiate this form as a distinct species.

2. *Amathusia dilucida*. (Tab. XXXVIII., fig. 7 ♂.)

*Amathusia Dilucida*, Honrath, Berl. Entomol. Zeitschr. Bd. xxviii. p. 206, t. 3, f. 3, t. 4, f. 3, b, ♀ (1884).

Male. Wings above very dark chocolate-brown; anterior wings with a broad and inwardly crescentic subapical resplendent pale violaceous fascia, commencing on costa, but not reaching outer margin, and inwardly occupying nearly apical half of cell; posterior wings with an evanescent violaceous outer margin, the abdominal area pale brownish, and with two small and obscure dark spots on the caudate prolongation.

\* A species recorded from Sikkim and Upper Tenasserim.

† Herr Honrath has advised me that he considers this form as a distinct species, and proposed describing it as *A. perakana*; this description, however, has not yet been published.

Wings beneath pale brownish, with a violaceous tinge; anterior wings with the following dark castaneous linear fasciæ:—three crossing cell, one passing through lower apex of cell and continued to lower median nervule, after which it is inwardly curved and more obscure towards inner margin, an obscure fascia beyond cell almost at right angles to the preceding one, a narrow curved submarginal fascia, and a very obscure and narrow marginal line; beneath the lower median nervule the ground colour is more or less bronzy. Posterior wings with the following linear dark castaneous fasciæ:—two crossing cell from costal margin, one crossing apex of cell and extending from costal margin to near lower median nervule, and one submarginal which tends towards the apex of the preceding and is then recurved upwardly to a little above anal angle, a curved fascia almost following the submedian nervule and a marginal linear fascia terminating above the caudate prolongation, which is more or less castaneous and has two small dark ocellated spots; two somewhat large ocellated spots, the first between the subcostal nervules and the second between the two lower median nervules and more or less uniting the two outer castaneous fasciæ. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 115 millim.

HAB.—Malay Peninsula; Perak (Künst.—colls. Semper, Ribbe, Dist., and Calc. Mus.).

The position of this proposed species is more that of a constant local form of *A. portheus*, Feld.,\* and is intermediate between that and the Bornean *A. ottomana*, Butl. All these so-called species are almost exactly similar in markings beneath, and so also are *A. amythaon*, Doubl., and *A. westwoodii*, Butl.,† supposing both of these are really not conspecific with *A. portheus*. At all events they form a small group of so-called species, distributed over a continuous or contiguous area, possessing a common facies, and differing locally in slight, if though constant respects, and generally by the difference in size of the violaceous subapical fascia to the anterior wings.

#### Genus ZEUXIDIA (*antea*, p. 72).

##### 1. *Zeuxidia amethystus* (*antea*, p. 72), var. ♂. (Tab. XXXVIII., fig. 5.)

Since describing and figuring the above I have received from Perak the male specimen now figured which possesses only two ocellated spots on the under surface of the posterior wings, and differs somewhat in the bluish markings above. This is really the typical form of the species, but I do not imagine that the variety previously figured is anything but another phase of the specific form of *Z. amethystus*.

##### 2. *Zeuxidia doubledaii*. (Tab. XXXVIII., fig. 6 ?.)

*Zeuxidia Doubledaii*, Westwood, Gen. Diurn. Lep. p. 329, n. 2, note, t. 52, f. 1 (1851); Marsh. & de Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 274, n. 274 (1882).

Male. Wings above very dark chocolate-brown; anterior wings with a curved, subapical pale violaceous-blue fascia, which commences at costa a little beyond end of cell, and is narrowed and terminates near outer angle; posterior wings with a broad submarginal pale violaceous-blue fascia extending from costa to near anal angle, where it is narrowed. Wings beneath pale brownish-ochraceous, both wings crossed by a narrow castaneous fascia commencing near costa on anterior wings at a little beyond end of cell and terminating on posterior wings at anal angle; beyond this fascia there is on anterior wings a small and very obscure greyish subapical spot, and on posterior wings two

\* A species found in North-East India and Upper Tenasserim.

† Both recorded from Sylhet.

ocellated spots—one between the subcostal nervules and the other between the two lower median nervules; some irregular and obscure fasciæ cross the cell of anterior wings, and there is an obscure waved submarginal line to both wings. Body and legs more or less concolorous with wings.

Female. Larger and paler in hue than the male; wings above brown, anterior wings with a pale violaceous subapical fascia, more irregular in shape than that of the male, and broken and traversed with a waved brown fascia at the area of the median nervules, a broken waved pale violaceous submarginal fascia, which above the lower discoidal nerve



FIG. 124.—*Zenxidea doubledaii*, ♂.

vule is practically obsolete and is principally represented by a greyish apical spot; posterior wings with a submarginal series of contiguous pale violaceous spots placed between the nervules, palest inwardly, and outwardly shading off to margin, a dark oblique line crossing disk at end of cell. Wings beneath as in male, but paler and more mottled and ornamented with darker markings.

Exp. wings, ♂, 98 millim.; ♀, 113 millim.

HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.); Perak (Künst.—Calc. Mus.).

This is a very rare species. A male specimen (see woodcut) collected at Penang by the Rev. L. C. Biggs is the only specimen I possess, whilst the female specimen here figured is contained in the Calcutta Museum, and was captured by Künstler in Perak.

##### 5. *Zeuxidea aurelius*. (Tab. XXXVII., fig. 1 ♂.)

*Papilio Aurelius*, Cramer, Pap. Ex. ii. t. 168, A, B (1779).

*Morpho Aurelius*, Godt. Enc. Méth. ix. p. 439, n. 1 (1823).

*Zeuxidia Aurelius*, Hew. Ex. Butt. iv. *Zeux. et Amona*, f. 1, 2 (1868).

Male. Wings above very dark chocolate-brown; anterior wings with a very large and curved violaceous fascia occupying the largest portion of cell and extending to outer margin, where it is bounded by the apex and by the lower median nervule, a patch of greyish-white scales at apex, and the outer angle also greyish; posterior wings paler brown, excepting basal area, and containing a large violaceous patch between the second median nervule and the submedian nervure, a spot of the same colour between the two upper median nervules, and an indistinct violaceous patch at anal angle. Wings beneath dark creamy-white; anterior wings with a large fuscous patch almost bounded by the median nervure and the second median nervule, and almost extending to outer angle, cell crossed by three irregular brownish fasciæ, a short oblique fascia of the same colour passing through lower end of cell, followed by a very obscure pale brownish discal fascia, a submarginal waved fascia and an obscure marginal line; posterior wings with some dark greyish shadings, a few dark brownish streaks at base, two crossing cell, the outermost broadest and inwardly greyish, a longer fascia passing through lower apex of cell and two ocellated spots—one between the subcostal nervules and the other between the two lower median nervules. Body above dark chocolate-brown.

JULY 30, 1886.

5 Q

Exp. wings, ♂, 110 millim.

HAB.—Malay Peninsula; Perak (Künst.—coll. Semper).—Sumatra (coll. Hewits.).

The specimen figured is the only one I have seen from the Malay Peninsula; it is one of Künstler's captures in Perak, and is contained in the collection of Herr Georg Semper, to whom I am much indebted for kindly forwarding the same to me for insertion here.

Genus DISCOPHORA (*antea*, p. 74).

1. *Discophora tullia* (*antea*, p. 74).

As previously stated (*antea*, p. 75), in the male specimens from the Malay Peninsula which I had identified as Cramer's species, the anterior wings were unspotted, "but in specimens from Continental India there are usually three discal rows of pale spots between the end of cell and outer margin." Messrs. Marshall and de Nicéville have since expressed an opinion that this may possibly prove to be the *Discophora zal* of Westwood.\* I have, however, been able to show that this is not the case;† but still no typical form of *D. tullia* has yet reached me from our fauna. The difficulty has also been increased by the receipt of a number of male specimens of an allied species, *D. sondaica*, Boisd. I therefore propose that we should for the present enumerate the Malay form as—

1. *Discophora tullia*, *var.*

2. *Discophora sondaica*. (Tab. XLIII., fig. 7 ♂.)

*Discophora Sondaica*, Boisduval, Sp. Gén. i. t. 12, f. 3 (1836).

Male. Closely allied to the corresponding sex of *D. tullia*, but differing on the upper surface of the anterior wings by having three bluish discal spots separated by the lower discoidal and upper median nervules, and three smaller outer bluish spots separated by the first and second median nervules.

Exp. wings, ♂, 70 to 75 millim.

HAB.—Malay Peninsula; Perak (Künst.—colls. Semp. & Cale. Mus.); Sungei Ujong (Godfery—coll. Dist.).—Sumatra (Forbes—coll. Dist.).—Java (Boisd.).

This species—for the reasons above given—will naturally follow our *D. tullia*, *var.* Capt. Godfery, who sent home a specimen from Sungei Ujong, informed me that it was "captured in a very dark and deeply shaded spot, which I can only compare to the gloom of a pine forest in Scotland."

Genus THAUMANTIS (*antea*, p. 77).

2. *Thaumantis noureddin* (*antea*, p. 78.)

The following interesting observation relating to the apparent stridulation of the species was sent home to me from Singapore by Capt. Godfery. "One evening in a broad grassy path after having shot a 'mouse-deer,' I watched a pair of *Thaumantis noureddin* playing together as they circled round each other. I noticed that one, presumably the male, in his flight around the other produced a most curious cracking or rattling noise. This immediately struck my attention, as I had never before heard of a butterfly capable of making any sound, except perhaps the almost imperceptible flutter of its wings in the air. The noise in the present

\* Butt. Ind., Burm. & Ceyl. vol. i. p. 299.

† Ann. & Mag. Nat. Hist. ser. 5, vol. xii. p. 352 (1883).



instance was evidently emitted at the creature's will, and was distinctly audible within two or three yards of the insect. I had only my gun with me, and therefore was unable to catch the butterfly. I am certain, however, it was the *Thaumantis noureddin*, of which I had caught several in the same neighbourhood within the previous three or four days."\*

#### 4. *Thaumantis odana*. (Tab. XXXVI., fig. 3.)

- Morpho Odana*, Godart, Enc. Méth. ix. p. 445, n. 16 (1823); Horsf. Cat. Lep. E. I. C. t. 6, f. 5, 5a (1829).  
*Thaumantis Odana*, Boisd. Sp. Gén. i. t. 12, f. 1 (1836); Westw. Trans. Ent. Soc. ser. 2, vol. iv. p. 170 (1858);  
 Druce, Proc. Zool. Soc. 1873, p. 341, n. 1.  
*Thaumantis Oda*, Hübn. Samml. Ex. Schmett. (1816-1824).  
*Morpho Klugius*, Zink. Nova Acta Acad. Nat. Cur. xv. p. 165, t. 15, f. 12, 13 (1831).

Male. Wings above dark chocolate-brown, fringe greyish-ochraceous; anterior wings with an oblique blue fascia crossing wing a little beyond end of cell, and with three contiguous greyish-white subapical spots. Wings beneath much paler than above; anterior wings with three fasciæ crossing cell, a patch beyond cell, and a large subapical triangular patch dark castaneous, the triangular patch is inwardly margined with a greyish-white oblique fascia; posterior wings crossed by two waved and narrow castaneous fasciæ near base, the colour between which to about the median nervure is also castaneous, beyond the outer fascia is a large subtriangular castaneous patch margined inwardly and outwardly with violaceous, and containing two ocellated spots, the smallest situate between the subcostal nervules and the largest placed between the two lower median nervules, a small black marginal spot at anal angle and the base violaceous-grey containing a dark castaneous irregularly formed spot. Body and legs more or less concolorous with wings.

Exp. wings, 104 millim.

HAB.—Malay Peninsula; Perak (Künst.—Calc. Mus.); Singapore (Wall.—Westw.).—Sumatra (coll. Hewitson).—Java (coll. Dist.).—Borneo (Druce).

The only specimen of this species which I have seen from the Malay Peninsula is in a fine collection made by Künstler for Dr. J. Anderson, and which is here figured.

It will, in this enumeration, follow *T. noureddin*.

#### Genus TENARIS (to follow THAUMANTIS).

- Tenaris*, Hübner, Verz. bek. Schmett. pp. 52, 53 (1816).  
*Drusilla* (nom. præocc.), Swains. Zool. Ill. i. t. 11 (1820); Westw. Gen. Diurn. Lep. p. 334 (1851); Trans. Ent. Soc. ser. 2, vol. iv. p. 180 (1858).  
*Hyades*, Boisd. Voy. Astr. Léop. p. 157 (1832); Blanch. Hist. Nat. Ins. iii. p. 455 (1840).

This genus may at once be separated from *Thaumantis* in a synoptical manner by the character of the inner margin of the anterior wings, which is convex at base and then concavely sinuate to outer angle; the anal angle of the posterior wings is always rounded and never produced in caudate prolongation. The first subcostal nervule of the anterior wings is emitted at about one-fourth before the end of the cell, and does not anastomose with the costal nervure; the second, third, fourth and fifth subcostal nervules are

\* A similar observation was made by both Lacordaire and Mr. Darwin in South America in reference to *Ageronia feronia*. Mr. Darwin wrote:—"Several times when a pair, probably male and female, were chasing each other in an irregular course, they passed within a few yards of me; and I distinctly heard a clicking noise, similar to that produced by a toothed wheel passing under a spring catch. The noise was continued at short intervals, and could be distinguished at about twenty yards distance; I am certain there is no error in the observation" (Journ. Research. Nat. Hist. & Geol. Voy. Beagle, pp. 33-4, 1860). Mr. Wallace also observed the same fact, and as he never heard the noise made by the small species of the genus he was inclined to believe "that it is produced in some way by the contact of two insects, and that only the larger and stronger winged species can produce it" ("On the Habits of the Butterflies of the Amazon Valley"—Trans. Ent. Soc. 1853).

emitted somewhat close together near apex. Another prominent feature is the large ocellated spots with which the posterior wings of the species are ornamented, and the general hue and pattern throughout.

*Tenaris* is an insular genus, being found throughout the Malay Archipelago, particularly in the Papuan Region.

1. *Tenaris birchi*. (Tab. XXXIX., fig. 7.)

*Tenaris Birchii*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xii, p. 241 (1883).

Male. Anterior wings above pale fuscous. Posterior wings greyish-white, costal area to above the median nervules pale fuscous, with a large ocellated spot, of which the centre is blackish with a pale central eye, situate between the second and third median nervules, and which is broadly surrounded with ochraceous; a second very indistinct spot is situate on and above the lower subcostal nervule. Anterior wings beneath as above, but darker towards base. Posterior wings beneath as above, but with the basal area obliquely dark fuscous; the lower ocellated spot larger and brighter than above, the upper spot bright and concolorous but smaller than the lower spot, and situate on the subcostal nervules. Palpi ochraceous. Body dark obscure ochraceous.

Exp. wings, 70 millim.

HAB.—Malay Peninsula; Singapore (Birch—coll. Dist.).

This species is allied to the Javan *T. horsfieldii* and to an undescribed Bornean species, and is extremely interesting as being the first representative of the genus recorded from the Peninsula. It was caught by J. K. Birch, Esq., who captured it whilst flying along a road in Singapore. He wrote to me at the time, "Seeing it was a strange one, I knocked it down with a stick," thus not only securing an undescribed species, but also, for the first time, proving that the genus *Tenaris* is found in the Malay Peninsula.

Genus CLEROME (*antea*, p. 81).

1. *Clerome gracilis* (*antea*, p. 81).

This species has been found somewhat plentiful in North Borneo by Mr. Pryer.

3. *Clerome arcesilaus*. (Tab. XL., fig. 5.)

*Papilio Arcesilaus*, Fabricius (nec. Cram.), Mant. Ins. ii. p. 28, n. 205 (1787); Ent. Syst. iii. p. 153, n. 470 (1793); Don. Ins. Ind. t. 30, f. 2 (1800).

*Clerome Arcesilaus*, Doub. Hew. Gen. Diurn. Lep. t. 54\*, f. 5 (1851); Westw. Trans. Ent. Soc. ser. 2, vol. iv. p. 183 (1858); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 213, n. 436 (1857); Butl. Cat. Fabr. Lep. p. 44, n. 2 (1869); Druce, Proc. Zool. Soc. 1873, p. 341, n. 1; Snell. Lep. v. Midden-Sumatra, p. 16, n. 1 (1880); Marsh. & de Nic. Butt. Ind., Burm. & Ceyl. vol. i. p. 313, n. 295 (1882); Kheil. Rhop. der Insel. Nias, p. 20, n. 32 (1884).

*Faunis Caneus*, Hübn. Samml. Ex. Schmett. (1816–1824).

*Morpho Leonteus*, Zink. Nova Acta Acad. Nat. Cur. xv. p. 170, t. 16, f. 14, 15 (1831).

Male and Female. Wings above cinnamoneous-brown; apex of anterior wings and outer margins of both wings darker. Wings beneath fuscous-brown, both wings crossed by two dark curved discal fasciæ, the innermost crossing cells of both wings; the outermost—which is strongly sinuated—crossing beyond cells; beyond this fascia are a series of small greyish-white spots, six on anterior wings and seven on posterior wings, both wings with a fuscous submarginal line. Anterior wings with a linear fuscous streak

in cell and the upper disco-cellular nervule also shaded with fuscous. Body and legs more or less concolorous with wings.

Exp. wings, 58 to 70 millim.

HAB.—Continental India; Sikkim, Sylhet (Marsh. & de Nic.).—Upper Tenasserim (Marsh. & de Nic.).—Malay Peninsula; Penang (Birch—coll. Dist.); Perak (Künst.—Cale. Mus.); Sungei Ujong (Durnford—coll. Dist.); Malacca (Biggs—coll. Dist.); Singapore (Westwood).—Siam (Marsh. & de Nic.).—Nias Island (Kheil).—Sumatra (Snellen).—Java (coll. Dist.).—Borneo (Druce).

Although at the time of writing on the genus *Clerome* I had not seen an authenticated specimen of this species from the Malay Peninsula, I have since freely received it from several correspondents. It seems subject to little variation, though some Perak examples are very darkly coloured on the under surface of the wings.

Capt. Godfery, a most observant collector, who captured this species at Sungei Ujong, supplied the following particulars:—"Taken in a shady nook near a well. Its flight was very low. Issuing from the surrounding jungle it would flit along the path, or rest upon it for awhile and then return to the thickest shades."

*C. arcesilaus* will here follow *C. gracilis*.

#### Group NYMPHALINA (*antea*, p. 83).

#### Genus KALLIMA (*to precede DOLESCHALLIA*).

*Kallima*, Westwood, Gen. Diurn. Lep. p. 324 (1850); Feld. Neues Lep. p. 14 (1861); Moore, Lep. Ceyl. vol. i. p. 36 (1881).

This genus is closely allied to *Doleschallia*, from which it may be separated by the following characters:—the cell of the anterior wing is not open by the abortion of the lower disco-cellular nervule, but is closed by that nervule, which is concave, and the third subcostal nervule of the anterior wings is emitted much nearer to the end of the cell than in *Doleschallia*.

*Kallima*, as previously anticipated (*antea*, p. 83), is now found to inhabit the Malay Peninsula. It is both an Ethiopian and Oriental genus, being found in Tropical Africa and also in Continental India, Ceylon, Andaman Islands, Burma, Tenasserim, Sumatra, Java, Borneo, and is probably somewhat widely distributed throughout the Malayan Archipelago. The species of *Kallima* are also generally known as "leaf-butterflies," from the extraordinary foliaceous resemblance of the under surface of the wings, a phenomenon which was forcibly described by Mr. Wallace, and is one of the best remembered and most often quoted facts in that author's charming "Malay Archipelago."

#### 1. *Kallima buxtoni*, var. (Tab. XXXVII., fig. 2.)

*Kallima Buxtoni*, Moore, Trans. Ent. Soc. 1879, p. 10.

The following is Mr. Moore's original description of his species:—

"Most like the Java species (*K. Paralekta*). Male, differs in the intensity of the blue of the upper-side, broader and more oblique band, the inner border of which terminates at its own width above the posterior angle; female, paler purple-blue, with broad fulvous band as in male. Underside, male, dusky greyish-green, vinous tinted and black speckled, with broad greyish fasciæ; female, pale greenish-ochraceous, vinous tinted; rib line only prominent."

Exp. wings, 90 to 96 millim.

HAB.—Malay Peninsula; Perak (Wray); Sungei Ujong—1300 feet (Durnford—coll. Dist.).

AUGUST 30, 1886.

Mr. Moore's typical species is founded on Sumatran specimens, and from these the Malay form only differs by the narrower ochraceous subapical fascia to the anterior wings. Too much reliance must not be placed on the general hue and markings of the under surface of the wings, as this is an exceedingly variable character, and is in strong contrast in my two specimens from Sungei Ujong. These two specimens were obtained for me through the kind instrumentality of Capt. Godfery, and I was also favoured by coloured drawings made by a lady named Wray of a specimen found in the "inland district of Perak."

Genus VANESSA (to follow DOLESCHALLIA).

*Vanessa*, Fabricius, Ill. Mag. vi. p. 281 (1807); Latr. Enc. Méth. ix. p. 10 (1819); Moore, Lep. Ceyl. vol. i. p. 48 (1881).

*Polygonia*, *Eugonia*, et *Inachis*, Hübn. Verz. bek. Schmett. pp. 36, 37 (1816).

*Grapta*, Kirb. Fauna Bor. Amer. iv. p. 292 (1837).

*Grapta* et *Vanessa*, Doubl. Gen. Diurn. Lep. pp. 195, 198 (1848).

Anterior wings subtriangular, the costal margin arched and convex, the apex falcate and truncate, the outer margin deeply concave beneath apex, inner margin concavely sinuate near outer angle. Costal nervure extending beyond middle of costal margin, first subcostal nervure emitted at about one-fifth before end of cell, second close to end of cell, third at about one-third beyond cell, fourth and fifth bifurcating about midway between base of third and outer margin; upper disco-cellular nervule short, lower long, slender and obliquely directed outwardly, median nervules well separated, bases of second and third further apart than those of first and second. Posterior wings irregularly subovate, the apex concave, the outer margin waved and caudately angulated at apex of upper median nervule. Costal nervure extending to apex, first subcostal nervure emitted opposite to the base of the lower median nervule, first and second median nervules with an apparently common origin at end of cell. Body robust; palpi porrect, pilose and well produced upwardly and forwardly in front of head; antennæ long with a well-formed and rounded apical club.

*Vanessa* is a genus of very wide distribution. The Palearctic region appears to be its head-quarters, but the Himalayas have not prevented it reaching India, Ceylon, and the Malay Peninsula. It is also found in the Nearctic and in some portion of the Neotropical regions.

1. *Vanessa perakana*, n. sp. (Tab. XL., fig. 1.)

Wings above very dark fuscous; anterior wings with a small greyish-white subapical spot, an oblique bluish spot beyond end of cell, and a submarginal bluish macular fascia commencing beneath the lower discoidal nervule where it is narrowest, and terminating on inner margin where it is broadest; this fascia is more or less concavely sinuate outwardly and convexly sinuate inwardly; posterior wings with a broad bluish submarginal fascia, which is narrowest at costal margin, and is outwardly margined with some dark bluish linear markings, and with two somewhat obscure narrow bluish marginal fasciæ. Wings beneath dark violaceous with the basal and marginal areas thickly studded and densely covered with blackish strigæ, a distinct dark, much-waved and angulated fascia crossing both wings beyond cells; a small ochraceous spot at apices of both cells; the basal, apical and outer marginal areas of anterior wings and the basal and outer marginal areas of posterior wings more or less shaded with warm ochraceous. Body and legs more or less concolorous with wings.

Exp. wings, 66 millim.

HAB.—Malay Peninsula; Perak (Künst.—Calc. Mus.).

*V. perakana* belongs to a small group of species with bluish margins, such as the Indian *V. charonia*, the Ceylonese *V. haronica*, and the Japanese *V. glauconia*. It is allied to the first of

these species, from which it differs by the greater breadth of the bluish fasciæ on the upper surface of the wings, and as the Ceylonese butterfly has been specifically described, this insect also requires a distinctive name.

Genus SYMBRENTHIA (to follow RHINOPALPA).

*Symbrenthia*, Hübner, Verz. bek. Schmett. p. 43 (1816).

*Laogona*, Boisd. Sp. Gén. i. t. 10, f. 3 (1836); Doubl. Gen. Diurn. Lep. p. 190 (1848).

Anterior wings subtriangular, the costal margin moderately convex, the apex prominent but not falcate, the outer margin more or less concavely sinuate, the inner margin slightly convex at base, and concavely sinuate towards outer angle. Costal nervure robust, first subcostal nervule emitted at about one-third before end of cell, second just before end of cell, third emitted between end of cell and base of fourth, fourth and fifth bifurcating about midway between base of third and apex of wing; upper disco-cellular nervule short and concave, lower oblique and slightly concave, median nervules well separated, the first from end of cell. Posterior wings irregularly subovate, the costal margin oblique and very slightly convex, the posterior margin more or less waved and scalloped, and angularly produced at apex of upper median nervule. Costal nervule strongly arched at base and extending to apex of wing; subcostal and discoidal nervules emitted close together near upper end of cell. Body short and robust, palpi long and robust, well projecting before the eyes; antennæ moderately long, with an apical club, which is hollowed beneath and attenuated at apex. Legs moderately long and not prominently robust.

This genus is well represented in Continental India, and is distributed eastward through the Malay Peninsula and the Indo-Malayan region. To what extent it is distributed throughout the Malayan Archipelago it is at present impossible to say, but its area seems certainly focussed in Northern Continental India.

1. *Symbrenthia hypoclus*. (Tab. XLII., figs. 4 ♂, 5 ♀.)

*Papilio Hypoclus*, Cramer, Pap. Ex. iii. t. 220, C, D (1782).

*Vanessa Hypocla*, Godt. Enc. Méth. ix. p. 298, n. 5 (1819); Suppl. p. 818 (1823).

*Hypanurtia Hippocla*, Hübn. Samml. Ex. Schmett. (1816—1824).

*Papilio Lucina*, Cram. Pap. Ex. iv. t. 330, E, F. (1782).

*Laogona Hippocla*, Moore, Proc. Zool. Soc. 1865, p. 762.

*Symbrenthia Hypoclus*, De Nic. J. A. S. Beng. vol. L. p. 50, n. 18, p. 54: n. 18 (1881); Moore, Proc. Zool. Soc. 1882, p. 243, t. xi. f. 4, 4a; Kheil, Rhop. der Insel. Nias, p. 21, n. 39 (1884).

Male. Wings above blackish, with the following dark ochraceous markings:—anterior wings with an irregularly shaped fascia extending from base along median nervure to a little beyond end of cell, a curved fascia near outer angle, a short subapical fascia (sometimes broken as in specimen figured) and a small apical spot; posterior wings with a central and a submarginal fascia and a submarginal ochraceous line. Wings beneath ochraceous, much mottled with castaneous markings, of which the darkest and most prominent is an oblique fascia crossing both wings, passing beneath cell of anterior wings and across cell of posterior wings, and on posterior wings it bifurcates at costal margin; the costal margin of anterior wings is spotted with blackish, and there is a violaceous spot outwardly fuscous between the two upper median nervules of the same wings; the posterior wings have a bluish marginal patch of scales between the two upper median nervules. Body above blackish, anterior portion of head, pronotal collar, and base of abdomen ochraceous; body beneath and legs ochraceous.

Female. Larger than the male, the ochraceous markings above much larger; wings beneath with the ground colour paler than in male.

Exp. wings, ♂, 40 millim.; ♀, 50 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—Moore); Bengal (Moore); Sikkim (de Nic.);

Darjeeling (coll. Dist.).—Malay Peninsula; Perak (Goodrich—coll. Dist.).—Nias Island (coll. Dist.).—Borneo; Sarawak (coll. Dist.).

I am indebted to Lieut. Goodrich for the acquisition of this and the following species from the Malay Peninsula. In the North-West Himalaya the Rev. J. H. Hocking found the larva of this species "on nettle, August, 6200 feet";\* and in Sikkim Mr. de Nicéville describes it as "a very rapid flyer for so small an insect, but it frequently settles." †

2. *Symbrenthia hypatia*. (Tab. XLII., fig. 6 ♂.)

*Laogona Hypatia*, Wallace, Trans. Ent. Soc. 1869, p. 345.

The following is Mr. Wallace's original description:—

"Male. Form of wings nearly as in *L. hippocla*, the outline a little more even.

"Above: the markings are nearly as in *L. hippocla*, but the rufous band and markings are all enlarged, and have a very irregular outline, especially on the anterior wings.

"Beneath: quite distinct from *L. hippocla*; the ground colour whitish ochre, veined in a complicated net-work with deep rusty brown; near the middle of the outer margin on the upper-wings is an elongate blackish spot with a blue centre, enclosed on its inner side with a horse-shoe and a lunule of the ground colour; on the outer margin of the hind-wings is a row of brown spots enclosed by a double row of lunules on each side, the two central spots are violet-ash powdered with black, while the lateral ones consist of a brown ring with a whitish centre."

Exp. wings, "1.9 inch."

HAB.—Malay Peninsula; Perak (Goodrich—coll. Dist.).—Java (Wallace).

The above description, supplemented by Mr. Wallace's further remark, "This insect is somewhat intermediate between *L. Hippocla* and *L. Hypselis*," ‡ so thoroughly applies to the species captured by Lieut. Goodrich, and here figured, that I have little doubt as to the identification proving correct. I have been unable to compare it with the "type," as though Mr. H. Grose Smith acquired Mr. Wallace's collection, he writes to me, "I have no named species 'Hypatia,' though possibly it may be among my specimens."

Genus CHARAXES (*antea*, p. 101).

9. *Charaxes durnfordi*. (Tab. XL., fig. 8 ♂.)

*Charaxes Durnfordi*, Distant, Entomologist, vol. xvii. p. 191 (1884).

Male. Wings above dark brownish ochraceous; anterior wings with the apical half blackish, containing two transverse series of greyish-white angulated spots placed between the nervules, and with a somewhat obscure series of small greyish-white marginal spots, those at the outer angle largest and most distinct; two small obscure greyish-white spots at end of cell separated by the upper discoidal nervule; posterior wings with a very broad marginal greyish-white fascia, inwardly lunulated and margined with blackish, containing a central series of blackish spots with whitish centres, placed between the nervules—that at anal angle duplex—and with a narrow submarginal blackish line. Wings beneath brownish-grey; anterior wings with the cell containing a small black basal spot, and centrally crossed by a darker spot margined with blackish, an irregular darker fascia margined with blackish crossing wing at end of cell, where it is widest; beyond the fascia the ground colour is paler, and the whitish spots above are more or less distinctly visible beneath, a waved dark line separating the two discal series; posterior wings with two

\* Proc. Zool. Soc. 1882, p. 243.

† J. A. S. vol. L. p. 54 (1881).

‡ A species found in North-East India, Nias Island, Sumatra, and Java, and therefore probably to be discovered in the Malay Peninsula.

irregular darker fasciæ margined with blackish, one at base, the other crossing disk and terminating on abdominal margin; the outer white fascia with spots faintly visible beneath, its margin denoted by two waved or lunulated lines, the innermost bluish, the outer fuscous with the intervening ground colour ochraceous. Body above and beneath and legs more or less concolorous with wings.

Exp. wings, ♂, 93 millim.

HAB.—Malay Peninsula; Sungei Ujong (Durnford—coll. Godfery).

This beautiful and exceedingly distinct species\* seems to find its nearest ally in the Amboinese *C. euryalus*, Cram., and in this arrangement should precede *C. harpax*. It is one of the entomological novelties captured by Mr. Durnford at Sungei Ujong, and is now in the collection of Capt. Godfery.

#### 10. *Charaxes borneënsis*, var. (Tab. XXXVII., fig. 6 ♂.)

*Charaxes Borneensis*, Butler, Lep. Ex. p. 16, n. 7, t. 6, f. 2 (1869); Druce, Proc. Zool. Soc. 1873, p. 346, n. 8.

Male. Wings above rufous-brown; anterior wings with the apical half—narrowing to outer angle—blackish and preceded by a transverse greyish-white fascia crossing wing at end of cell; this fascia is outwardly scalloped and inwardly more or less narrowly margined with blackish, a black disco-cellular spot at end of cell containing a greyish-white central line, and a small whitish spot in and at upper end of cell; posterior wings with the apex more or less blackish and with a submarginal series of blackish spots inwardly marked with obscure greyish; abdominal area paler and less rufous. Wings beneath similar to those of *C. harpax*, but much darker, the waved black lines somewhat differently arranged and margined with greyish-white. Body more or less concolorous with wings; legs with the femora tinged with greyish, the tibiæ and tarsi ochraceous.

Exp. wings, ♂, 85 millim.

HAB.—Malay Peninsula; Perak (Künstl.—coll. Semper).—Sumatra; † Borneo (Lowe—coll. Dist.); Sarawak (Wall.—Butl.).

The Perak form of this species—judging from the specimen here figured—differs from Bornean typical examples in possessing the small greyish-white spot in the upper end of the cell of the anterior wings, and also by the greyish-white fascia of the same wings which extends nearer to the costal margin, and is also less inwardly bordered with black.

I have only seen one specimen from the Malay Peninsula, and that was kindly lent to me by Herr Georg Semper, in whose collection it remains.

It is here arranged after *C. durnfordi*.

#### 11. *Charaxes baya*. (Tab. XXXVI., fig. 1 ♂.)

*Charaxes Baya*, Moore (Horsf. & Moore), Cat. Lep. E. I. C. vol. i. p. 207, n. 424 (1857); Butl. Proc. Zool. Soc. 1865, p. 636, n. 53, t. 37, f. 5.

The following is Mr. Moore's original description:—

“Allied to *Nymph. Psaphon*, Westwood, Cabinet Orient. Ent. t. 24, f. 1, 2, from Ceylon, but differs in the male in having the black exterior border of the *fore-wing* much narrower, it not extending to the middle of the posterior margin, as in that species, but is confined to the angle: on the *hind-wing* the apical patch is also smaller, and continued in a series of six white-centred spots to anal angle; a small blackish spot at extremity of the discoidal-cell. Under-side glossy greenish buffy-brown. Female paler above: *fore-wing*

\* Another allied but very distinct species from Burma has just been described by Mr. H. Grose Smith under the name of *Nymphalis Nicholii* (Ann. & Mag. Nat. Hist. ser. 5, vol. xviii. p. 150 (1886).

† Smith, in Bock, 'Head Hunters of Borneo,' Append. V., p. 336.

with a broad central yellowish band; a small round yellowish spot near the apex; a patch of black at extremity of discoidal-cell, and narrow zigzag line bordering the black band: hind wing with the central upper portion of disc yellowish; submarginal row of spots clearly defined, and all centred with clear white. Under-side more variegated than the male, and much paler. Tails two, short in the male; *both* long in the female."

Exp. wings, ♂, "2 $\frac{3}{4}$  inches"; ♀, "rather more than 3 inches."

HAB.—Continental India; "N. India" (Buckley—Moore).—Malay Peninsula; Perak (Künstl.—coll. Anderson).—Java (coll. Horsf.).—Borneo (Brit. Mus.).

This species is allied to *C. harpax*, from which, however, it is easily distinguishable. The Perak specimen here figured is in the collection made by Künstler for Dr. J. Anderson, and is, I believe, destined for the Calcutta Museum.

## 12. *Charaxes distanti*. (Tab. XXXVI., fig. 2 ♂.)

*Charaxes Distanti*, Honrath, Berl. Entomol. Zeitschr. Bd. xxix, p. 277 (1885).

I only know this species by a coloured drawing which Herr Honrath kindly sent me, and which is here reproduced. It is therefore better to give the original description:—

"Grundfarbe gelbbraun; die breite Binde am Aussenrande der Vorderflügel rothbraun, in ähnlicher Weise verlaufend, wie die mehr schwärzliche bei *Marmax* Wstw., woran *Distanti* am meisten erinnert."

"Die Hinterflügel haben am Aussenrande eine schmale braune Einfassung die bei *Marmax* fehlt. Die dem Aussenrande parallel laufenden augenartigen Flecken sind schwächer und namentlich in den vordern zellen lange nicht so entwickelt wie bei *Marmax*. Bei einem Stück von Sarawak, woher Dr. Staudinger 2 ♂♂ von Dr. Platen erhielt, sind diese Flecken fast nur noch angedeutet."

"Die ebenfalls gelbbraune, aber mattere Unterseite zeigt einen auffallenden Unterscheid darin, dass der Vorderrand der Vorderflügel von der Basis bis zum Schlusse der Discoidalzelle hellweiss gefärbt ist. Ausserdem verläuft zwischen Discoidalzelle und Saum der Hinterflügel von der Spitze bis zum Analwinkel eine dunkelstahlblau schillernde, geradlinige Binde, welche bei *Marmax* sich als schwache und wellenförmige und durchaus nicht gerade zeigt."

"Die Oberschenkel der Mittelbeine sind ebenso wie die der Hinterbeine bei *Distanti* weiss bestäubt, während sie bei *Marmax* mehr bräunlich sind."

Exp. wings,\* ♂, 72 millim.

HAB.—Malay Peninsula; Perak (Künstl.—coll. Honrath).—Borneo; Sarawak (Honrath).

## Genus PROTHOE (*antea*, p. 110).

Several distinct races or species have generally been confounded under the name of the Javan species *P. franckii*, † which is distinguished by having a broad white band intersecting the oblique bluish fascia on the anterior wings. Mr. Butler has recently separated these local forms or species, of which two occur in the Malay Peninsula, and I have thought it best to give here his own differential diagnoses.

### 2. *Prothoe uniformis*. (Tab. XXXVIII., fig. 4.)

*Prothoe uniformis*, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xvi. p. 53 (1885).

"Oblique belt of primaries without white band or spots, excepting upon the costal border; apical area and external border of secondaries chocolate-brown.

\* According to drawing of typical specimen.

† Previously stated (*antea*, p. 113) to have been recorded from Malacca by Mr. Wallace.



"Oblique belt moderately broad, greenish blue; secondaries elongated as in *P. Franckii*, with well-marked caudal appendage, apical markings white with bluish borders; prevalent colouring on external area of secondaries pinky greyish."

Exp. wings, 72 millim.

HAB.—Malay Peninsula; Perak (Künst.—Calc. Mus.).

Mr. Butler described *P. uniformis* from a specimen without a "locality-label," which he correctly surmised might prove to be a Malaccan species. It is, however, rare, the commoner one being the following, *P. angelica*. The figure here given is from a Perak specimen.

### 3. *Prothoe angelica*.

*Prothoe angelica*, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xvi. p. 53 (1885).

"Oblique belt of primaries shining azure or greenish, with a series of irregular white dashes to represent the central belt;\* apical area of secondaries purplish black; prevalent colouring on external area of secondaries below pale green."

Exp. wings, 68 to 74 millim.

HAB.—Tenasserim (Butler).—Malay Peninsula; Perak (Künst.—Calc. Mus.); Sungei Ujong (Godfery—coll. Dist.).—Sumatra (Butler).—Borneo (coll. Dist.).

I have not figured *P. angelica*, because it is easily differentiated from *P. uniformis* by the oblique bluish fascia to the anterior wings possessing a central series of white dashes or spots.

Capt. Godfery sent me the following interesting particulars relating to the capture of this species:—"While exploring a path in the forest parallel to the Linggi in Sungei Ujong, in company with a friend, we disturbed a butterfly of swift flight which settled high up on the trunk of a tree. Being beyond the reach of our nets we startled it from its resting place, when it flew to another tree and alighted in a similar position. We tried several times to secure it, but in vain, the height at which it rested rendering it safe from our attacks. Stimulated by curiosity at its unique habit of always selecting the trunk of a tall tree for its resting place, where, from its assuming a vertical position, with the edges only of its wings directed towards the spectator, and from its protective coloration, it was very hard to see, we determined to effect its capture, and eventually did so, by tying the handles of our nets together with a handkerchief. I imagine it to be of crepuscular habits from its reluctance to fly far, or indeed to leave its resting place," &c.

## Genus SYMPHÆDRA (*antea*, p. 112).

### 2. *Symphædra pardalis*. (Tab. XL., fig. 7 ♀.)

*Symphædra pardalis*, Staudinger & Schatz, Exotisch, Schmett. t. 54 (1885).

Female. Closely resembling the female of *S. dirtea* above; wings beneath pale chocolate-brown, not greenish-ochraceous as in *S. dirtea*, but spotted as in that species, the spots pale yellowish; posterior wings with the abdominal area pale violaceous.

Male. † *Resembling the female*, but smaller.

Exp. wings, ♀, 88 milim.

HAB.—Malay Peninsula; Perak (Künst.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.).

\* As in *P. franckii*.

† According to Staudinger and Schatz's figure, no description having yet been published.

The female appears to be simply a strongly coloured variety of *S. dirtea*, and as this I should still have considered it, had not Staudinger and Schatz figured the male which resembles the female. This at once separates it from the Fabrician species.

Genus EUTHALIA (*antea*, p. 114).

16. *Euthalia dunya*. (Tab. XXXVIII., fig. 1.)

*Adolias Dunya*, Doubleday & Hewitson, Gen. Diurn. Lep. t. 44, f. 3 (1850); Moore, Trans. Ent. Soc. ser. 2, vol. v. p. 84, n. 47 (1859); Druce, Proc. Zool. Soc. 1873, p. 345, n. 4.

Wings above brown; anterior wings with a very small black spot more or less surrounded with greyish-white in cell, and a black margined disco-cellular spot at end of cell, two greyish subcostal spots, one near the bifurcation of the fourth and fifth subcostal nervules and the other between it and end of cell, and a slightly oblique series of four spots with greyish centres (the third very slightly pale centred), the first placed between the two upper median nervules and the third and fourth between the lower median nervule and the submedian nervure. Posterior wings with two contiguous greyish spots, outwardly concave, and separated by the upper subcostal nervule, a transverse series of five black spots with large greyish centres placed between the nervules, an obscure blackish spot at end of cell, and a subobsolete fuscous submarginal fascia to both wings. Wings beneath pale greenish, the spots as above, but paler and more obscure, and with a very small fuscous spot in cell of posterior wings. Body more or less concolorous with wings; legs with the tibiae and tarsi ochraceous.

Exp. wings, 90 to 98 millim.

HAB.—Mergui Archipelago (coll. Anderson).—Malay Peninsula; Perak (Künstl.—Calc. Mus.).—Borneo (coll. Dist.); Sandakan (coll. Pryer).

This species is here arranged after *E. derma*.

17. *Euthalia bellata*. (Tab. XXXVII., fig. 4 ♂; Tab. XLIII., fig. 12 ♀.)

*Adolias Bellata*, Druce, Proc. Zool. Soc. 1873, p. 344, n. 3, t. 32, f. 3.

*Adolias Canaspolis*, Hewits. Ent. Mo. Mag. vol. xi. p. 183 (1875); Ex. Butt. V. Adol. t. 4, f. 14 (1875).

*Euthalia Goodrichi*, Dist. 'Entomologist,' vol. xix. p. 11 (1886).

Male. Wings above dark chocolate-brown; anterior wings with a small dark spot in cell and a dark disco-cellular spot at end of cell, a series of six greyish-white spots crossing wing beyond cell, the upper three smallest and the lower three largest,\* a small subapical greyish-white spot and a submarginal dark waved fascia; posterior wings crossed by a series of seven contiguous greyish-white spots, a dark waved submarginal fascia enclosing a series of small and very obscure pale spots. Wings beneath pale brownish-ochraceous, pale spots as above, but those on posterior wings more fused than above; anterior wings with the cellular spots black margined with reddish centres; posterior wings with a small cellular spot (sometimes absent) and a disco-cellular black margined spot; the submarginal fasciæ above only denoted by a series of dark spots beneath. Body and legs more or less concolorous with wings.

Female. Larger and very much paler than the male; anterior wings above with the transverse pale spots with a slight bluish tinge, the lowermost broken and duplex, the dark submarginal fascia (as in male), broken into a series of spots in female, and placed in a more or less bluish-grey area; posterior wings above with the pale spots very small and not extending beneath the upper median nervule, a small dark spot at end of cell and a waved submarginal dark fascia placed on a somewhat paler area. Wings beneath much paler than above; anterior wings with the spots in the cell larger and brighter, greyish-white spots as above, followed by a series of dark purplish spots much smaller than those above; posterior wings with a small spot in cell as above, and a disco-cellular spot at end of cell, the series of pale spots as above, but

\* The lowermost sometimes divided.

continued to abdominal margin a little above anal angle, the last spot being longest, the waved fascia above being replaced by a series of small dark spots as on anterior wings.

Exp. wings, ♂, 56 millim.; ♀, 75 millim.

HAB.—Malay Peninsula; Perak (Künstl.—coll. Semper; Goodrich—coll. Dist.).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).

On examining the interesting collection of *Rhopalocera* made by Mr. Pryer in Borneo, which possessed both sexes of this species, I first became cognisant that the *Adolias cenespolis* of Hewitson was the female of the *Adolias bellata*, Druce, and that further I had redescribed the female under the name of *Euthalia goodrichi*. It, however, seems to be a somewhat rare species in the Malay Peninsula, as I have seen very few male specimens, and only one female, for which I am indebted to its capturer, Lieut. Goodrich.

In this enumeration *E. bellata* may be placed after *E. dunya*.

### 18. *Euthalia parta*. (Tab. XXXVII., fig. 7.)

*Adolias Parta*, Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 185, n. 373 (1857); Trans. Ent. Soc. ser. 2, vol. v. p. 63, n. 2, t. 3, f. 1 (1859).

*Adolias apicalis*, Voll. Tijds. Ent. V. p. 186, n. 5, t. 10, f. 1 (1862).

The specimen figured has been identified by Mr. Moore as his *A. parta*, but as it somewhat differs from his figure I have thought it best to give a copy of the original description:—

“Male. Upperside dark brown with a vinaceous tinge: *fore-wing* with a paler transverse band, margined broadly on both sides with black, the anterior portion within, from costal margin on both sides, with a series of small white patches; marks within discoidal cell black, with dark brown centres; *hind-wing* with an inner blackish band and outer row of small black spots. Underside paler, marked as above.”

“Female. Upperside pale brown: *fore-wing* with broad whitish curved transverse band, with patch on costa and dark margins; *hind-wing* with rather broad inner band, and outer zigzag line, the point between each vein with a minute darker dot; space between inner band and base tinged with white; marks at base of wings blackish. Underside pale dull ochreous, with paler margins; markings as above, but very indistinct.”

Exp. wings, “♂ 2 $\frac{3}{8}$ , ♀ 2 $\frac{7}{8}$  inches.”

HAB.—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.); Malacca (Biggs—coll. Dist.).—Borneo (Moore).

I have only received male specimens of this species from the Peninsula. Its proper position in this enumeration appears to be between *E. garula* and *E. jama*.

### 19. *Euthalia merta*. (Tab. XLIII., fig. 1 ♂, 2 ♀.)

*Adolias Merta*, Moore, Trans. Ent. Soc. ser. 2, vol. v. p. 72, n. 19, t. 6, f. 4 (1859).

Male. Wings above dark fuscous-brown; anterior wings with the cell crossed by a black line near base which extends beneath the median nervure, two black lines at about centre and two—joined beneath—at end of cell, a broad and somewhat paler submarginal fascia the margins of which are dark fuscous, and a curved series of five whitish spots a little beyond cell, the lower two spots separated by the second median nervure, and two small subcostal and subapical spots of the same colour; posterior wings with the cell crossed by two black-margined spots,—one at centre and one at end,—a fuscous irregular fascia crossing wing beyond cell, and a submarginal series of small and very dark spots. Wings beneath brownish-ochraceous, marked as above, with the fuscous fasciæ more or less broken and obsolete; anterior wings with an obscure violaceous marginal fascia near apex; posterior wings with two additional black-margined

spots above cell separated by the upper subcostal nervule. Body above dark fuscous-brown; body beneath greyish; legs greyish, the tibiæ and tarsi brownish-ochraceous.

Female. The following is Mr. Moore's description:—"Upperside luteous-brown, paler beyond the middle of the fore-wings, where they are slightly glossed with pale green; a row of five white spots suffused with brown on fore-wing. Underside pale buff, with the lituræ nearly black and slender; the pale broad submarginal space clearer and nearly white, with blackish row of spots."

Exp. wings, ♂, 49 millim.; ♀, 56 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).—China? (Hope—coll. Oxford).

I think it is open to doubt whether the locality China is correct as referable to this species, and it is here only given on the authority of Mr. Moore, who found that habitat affixed to his type specimen. This is a very rare species, and the male has not hitherto been figured.

*E. merta* is here arranged after *E. jama*.

## 20. *Euthalia zichri*. (Tab. XLIII., fig. 6.)

*Adolias Zichri*, Butler, Cist. Ent. vol. i. p. 6 (1869).

"Wings above dark brown; the outer margin of the anterior wings bronzy, the band tapering from the anal angle to the apex, also two patches of the same colour near the costal margin and two spots near the base of the outer marginal band; the outer margin of the posterior wings of two colours, the inner and apical portion bronzy, showing three black spots, the outer portion except the apex greenish blue."

"Wings below pale brown, with the usual black characters at the base and two discal rows of black subhastate spots arranged nearly as in *A. parta*, Moore: body dark brown above, pale brown below; antennæ black above, brownish ferruginous below."

Exp. wings, ♂, 50 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).—Borneo; Sarawak (Brit. Mus.).

The Malaccan specimen here figured is a little paler beneath than the Bornean type, but in other respects exhibits no difference. I am indebted to Dr. Staudinger, of Dresden, for the opportunity of figuring this species.

## 5. *Euthalia lubentina*.

*Euthalia lubentina* (*antea*, p. 128).

Since inserting this species with doubt as to its truly belonging to our fauna, Messrs. Birch and Egerton have captured both sexes at Province Wellesley.

## 21. *Euthalia bipunctata*. (Tab. XLIII., fig. 3 ♂.)

*Adolias Bipunctata*, Vollenhoven, Tijd. Ent. v. p. 191, n. 11, t. 10, f. 4 (1862).

Male. Wings above dark fuscous-brown, both wings crossed beyond cells by two waved dark fasciæ; anterior wings with four dark lines crossing cell and one at end of cell, and with two small subapical greyish-white spots; posterior wings with four dark lines crossing cell. Wings beneath brownish-ochraceous, fasciæ and cellular markings as above; anterior wings with three dark spots beneath cell separated by the lower median nervule and the submedian nervule, the apex tinged with greenish; posterior wings with two circular spots above cell separated by the upper subcostal nervule, abdominal margin more or less greenish. Body and legs more or less concolorous with wings, the tibiæ and tarsi brownish-ochraceous.

Exp. wings, ♂, 48 to 53 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).—Borneo; Sandakan (Pryer—coll. Dist.).

I am at present ignorant as to the female of this species, which like so many others is common to the Peninsula and Borneo. The specimen figured is from Malacca, and belonging to Dr. Staudinger.

*E. bipunctata* is allied to *E. decorata*.

2. ***Euthalia decorata*** (*antea*, p. 122).

I have received the female of this species from Sungei Ujong. It is paler in hue than the figure given by Mr. Butler (woodcut 41, *antea*, p. 122), but this variability is not uncommon in the genus *Euthalia*.

The species has also been found by Mr. Pryer in Northern Borneo.

8. ***Euthalia ramada*** (*antea*, p. 122).

Since the description of this species was written a Perak female, in the collection of Herr Ribbe, has been examined. It somewhat resembles the female of *E. pusceda*.

22. ***Euthalia xiphiones***. (Tab. XXXVI., fig. 10 ♂, 9 ♀.)

*Adolias Xiphiones*, Butler, Proc. Zool. Soc. 1868, p. 609, n. 60, t. xlv. f. 6.

Male. "Affinis *A. apiadi* minor, supra obscurior castaneo-fusca lineis anticarum discalibus magis approximatis; posticæ fascia marginali viridi multo latiore: anticæ subtus basi flavescens, punctis apud apicem albicantibus; posticæ fundo toto flavo, maculis aræ analis cæruleo cinctis, aliter velut in *apiade*: corpus supra fuscum, subtus albidum."

Female. Wings above paler than in the male; anterior wings with two very obscure greyish subapical spots; posterior wings, unicolorous, without the bluish marginal fascia. Anterior wings beneath brownish-ochraceous, the base bluish, the two greyish spots above larger, paler and more prominent beneath, and a pale apical bluish-grey patch, other markings as above; posterior wings beneath pale bluish, spotted and marked as in male, the upper three of the double series of spots shaded with greenish-ochraceous, the apical margin brownish-ochraceous. Body and legs more or less concolorous with wings; legs streaked with brownish.

Exp. wings, ♂, 58 millim.; ♀, 70 millim.

HAB.—Burma; Moulmein (Brit. Mus.).—Malay Peninsula; Perak (Künstl.—Calc. Mus.).

This species is allied to the *E. apiades*, Mén., a species not uncommon in North-Eastern India.

23. ***Euthalia lepidea*, var.** (Tab. XXXVI., fig. 4 ♂, 5 ♀.)

*Adolias Lepidea*, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. i. p. 71 (1868); Moore, Proc. Zool. Soc. 1878, p. 830.

*Adolias Cocytus*, Moore (nec Fabr.), Trans. Ent. Soc. ser. 2, vol. v. p. 76, n. 28 (1859); Prittw. Stett. Ent. Zeit. 1867, p. 272.

Male. Wings above very dark chocolate-brown; anterior wings with the usual black cellular markings, and with a narrow ashy-grey outer margin commencing beneath apex; posterior wings with a broad ashy-grey outer marginal fascia gradually widening from apex to anal angle. Wings beneath pale brownish-ochraceous, and with two darker fasciæ crossing both wings beyond cells (sometimes almost obsolete as on specimen figured), the ashy-grey margins paler and more obsolete beneath; both wings with the usual cellular markings. Body and legs more or less concolorous with wings.

Female. Larger and paler in hue than the male, the wings beneath are brighter, the dark fasciæ more distinct, and on the anterior wings the colour between these fasciæ is warm brownish-ochraceous.

Exp. wings, ♂, 62 millim.; ♀, 70 to 75 millim.

HAB.—Continental India; Cachar (coll. Dist.).—Burma; Akyab (coll. Dist.).—Tenasserim; Meetau (Limborg—Moore).—Malay Peninsula; Perak (Künstl.—Calc. Mus.).

The few specimens from Perak which have passed through my hands are certainly—especially in the males—more melanic in hue than my Indian and Burmese examples. Perak specimens are also variable in the intensity of the markings beneath, as is shown by those here figured.

Genus TANAËCIA (*antea*, p. 128).

6. *Tanaëcia consanguinea*. (Tab. XLIII., fig. 4.)

*Tanaëcia consanguinea*, Distant, 'Entomologist,' vol. xix. p. 11 (1886).

Male. Closely allied to *T. pulasara*, but differing in the following particulars:—The six contiguous transverse spots on the apical half of the anterior wings are more regular in size, and therefore their inner margins are subparallel, and not so deeply and sinuously irregular, as in *T. pulasara*; these spots are also darker in hue; the posterior wings have the outer margin of the contiguous spots on outer area bordered with greyish-white, and the violaceous apical shading in *T. pulasara* is absent in *T. consanguinea*; anterior wings beneath with corresponding differences as above.

Exp. wings, ♂, 55 millim.

HAB.—Malay Peninsula; Perak (Künstl.—coll. Ribbe).—Singapore (coll. Godfrey).

7. *Tanaëcia robertsi* (*antea*, p. 132).

This species is still only known to me by Mr. Butler's description, no specimen having been found in any of the numerous collections which have passed through my hands during the last few years.

8. *Tanaëcia nicévillei*.\* (Tab. XL., fig. 9.)

*Tanaëcia nicévillei*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xiv. p. 199 (1884).

Male. Wings above very dark brownish, with a violaceous tinge; anterior wings with the cell crossed by two basal black lines, continued beneath to the submedian nervure, two black lines near middle of cell, the innermost of which has a parallel line between the lower median nervule and the submedian nervure, and a single black line at end of cell; a small bluish spot near apex and a marginal bluish fascia commencing about centre of wing and gradually widening to outer angle, where it possesses two inner lanceolate black spots beneath the lower median nervule, and an inner black streak at inner margin; posterior wings with a very broad outer marginal bluish fascia, narrowest at apex of wing, inwardly margined with small blackish spots, and containing a central series of blackish spots placed between the nervules, which become practically obsolete at the area of the median nervules; three obscure blackish lines crossing cell, two near centre and one at apex; abdominal margin brownish-ochraceous. Wings beneath pale brownish-ochraceous; anterior wings with the black linear markings as above, followed by a transverse series of five broad fuscous streaks placed between the nervules, those at end of cell largest; a pale violaceous marginal fascia with an inner series of lanceolate blackish spots; posterior wings with the broad outer bluish fascia as above, but paler and more violaceous, its central spots smaller, but more continuous and distinct, the three dark lines crossing cell as above, a looped line beneath the costal

\* Named after my friend Mr. L. de Nicéville, of Calcutta, joint author with Col. Marshall of the 'Butterflies of India, Burma and Ceylon.'

nervure, and an outer cellular series of three dark spots separated by the lower subcostal and discoidal nervules. Body above and beneath, with legs, more or less concolorous with wings.

Exp. wings, ♂, 57 millim.

HAB.—Malay Peninsula; Perak (Künstl.—Calc. Mus.).

*T. nicévillei* is allied to the Bornean species *T. clathrata*, Vollenh., and appears to be a scarce species.

Genus EURIPUS (*antea*, p. 133).

3. *Euripus halitherses*, var. ♀. (Tab. XLIII., fig. 11).

*Euripus Halitherses*, Doubleday & Hewitson, Gen. Diurn. Lep. t. 41, f. 2 (1850).

*Hestina Isa*, Moore (Horsf. & Moore), Cat. Lep. E. I. C. vol. i. p. 161, n. 333 (1857).

*Euripus Haliartus*, Feld. Wien. Ent. Mon. iv. p. 234, n. 81 (1860).

Female. Differs from the female of *E. euplœoides* by its much darker coloration, the anterior wings with no spot in cell, and the oblique macular fascia somewhat smaller; posterior wings with the inner whitish basal area smaller, and not reaching the subcostal nervure.

Exp. wings, ♀, 72 millim.

HAB.—Malay Peninsula; Malacca (coll. Godfery).

A single female specimen collected by Capt. Godfery forms my only knowledge of this butterfly in the Malay Peninsula. It is clearly a variety or race of *E. halitherses*, but whether it should have a distinctive name like *E. euplœoides* can only be determined when more specimens are collected, and the differences (principally the size of the inner whitish area to the posterior wings) are found to be constant or the reverse.

Genus EURYTELA (*antea*, p. 135).

1. *Eurytela castlenau* (*antea*, p. 136). (Tab. XLIII., fig. 10 ♀.)

Female. Wings above brownish-ochraceous; anterior wings with the outer area beyond and beneath cell paler in hue; posterior wings with a basal and central dark area, but both wings crossed by four dark linear fasciæ, two near base, one beyond cells and one submarginal, the third much waved on the anterior wings, and the fourth much waved on both wings. Wings beneath much paler and more unicolorous than above, fasciæ as above. Body and legs more or less concolorous with wings.

Exp. wings, ♀, 50 millim.

HAB.—Malay Peninsula; Perak (Künstl.—coll. Dist.).

The sexes of this species are widely divergent in hue, and the female is not only a very rare insect, but does not appear to have been previously figured.

Genus ERGOLIS (*antea*, p. 137).

3. *Ergolis isæus* (*antea*, p. 139). (Tab. XXXIX., fig. 6.)

Since publishing Mr. Wallace's description of the above I have acquired specimens, and am now able to figure the species.

Additional HAB.—Malay Peninsula; Perak (Künstl.—coll. Semper); Singapore (Godfery—coll. Dist.).

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5 v

Genus CYRESTIS (*antea*, p. 139).3. *Cyrestis cocles*. (Tab. XLI., fig. 13.)

*Papilio Cocles*, Fabricius, Mant. Ins. ii. p. 7, n. 83 (1787); Ent. Syst. iii. p. 65, n. 204 (1793); Don. Ins. Ind. t. 23, f. 2 (1800).

*Cyrestis Cocles*, Butl. Cat. Fabr. Lep. p. 82, n. 1 (1869); Moore, Proc. Zool. Soc. 1878, p. 829; Wood-Mas. and de Nic. J. A. S. Beng. vol. xlix. p. 228, n. 22 (1880).

Male. Wings above pale creamy yellowish; anterior wings with the cell crossed by three dark greyish and ochraceous fasciæ, a short disco-cellular fascia consisting of three dark greyish lines at end of cell, a short dark greyish and ochraceous fascia beyond end of cell, two similar fasciæ beneath cell, two small subcostal spots at end of cell, and a broad outer darker margin consisting of waved and somewhat reticulated dark greyish and pale ochraceous markings, and containing some very obscure central spots; a black submarginal line, the margin ochraceous, inwardly bluish, the fringe creamy white; posterior wings with two basal dark greyish and ochraceous fasciæ, the outer one much angulated and continued inwardly towards anal angle; between these fasciæ is a short disco-cellular fascia as on anterior wings, a short and obscure ochraceous fascia at base, and the outer marginal area as on anterior wings, but with a distinct central series of five spots with dark bluish centres, two small bluish-grey patches marked with black on anal-angular area, caudate prolongation bluish-grey. Wings beneath pale creamy white, with the fasciæ and markings above pale and indistinct beneath, the outer marginal spots, however, larger and blacker, three showing distinctly on anterior wings (two small and subapical and one between the two lower median nervules). Body and legs more or less concolorous with wings.

Exp. wings, ♂, 54 millim.

HAB.—Continental India; Silhet (Brit. Mus.).—Andaman Islands; Port Blair (Wood-Mas. & de Nic.).—Tenasserim; Hatsiega (Limborg—Moore).—Malay Peninsula; Penang (Biggs—coll. Dist.); Perak (Godfery—coll. Dist.; Künstl.—Calc. Mus.).

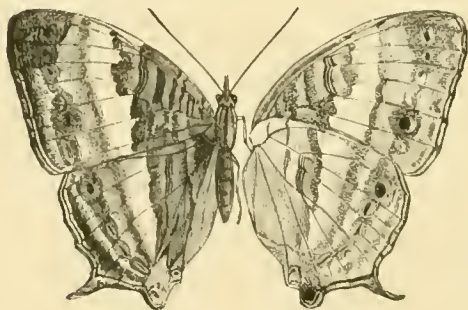
4. *Cyrestis formosa*.

FIG. 125.—*Cyrestis formosa*.

*Cyrestis formosa*, Felder, Reise Nov. Lep. iii. p. 412, n. 631 (1866); Wood-Mas. & de Nic. J. A. S. Beng. vol. l. p. 246, n. 30 (1881).

*Cyrestis horatius*, Wood-Mas. & de Nic. Proc. As. Soc. Beng. 1881, August, p. 142.

Messrs. Wood-Mason and de Nicéville have so clearly described this species that I reproduce their words:—

“Allied to *C. cocles*, with which it agrees almost exactly in the character of the markings of the upperside, but from which it differs in the pure white ground-colour, painted with different shades of sepia-brown instead of pale ochraceous-fuscous and black, the black marks of *C. cocles* being represented by the darkest

of the sepia colouring, in its larger and more distinct ocelli, and in having a distinct but pale fulvous patch at the anal angle of the posterior wing; and, on the underside, in having only the lightest portions of the sepia markings absent and replaced by white or whitish.”

Exp. wings, ♂, 53 to 59 millim.

HAB.—Continental India; Orissa (Wood-Mas. & de Nic.).—Andaman Islands (coll. Dist.).—Malay Peninsula; Perak (Künstl.—Calc. Mus.).



Some specimens of *C. formosa* received from Perak are much paler in hue, and seem to connect it with the form or species I described as *C. carli* (*antea*, p. 141). Mr. de Nicéville has communicated his opinion to me that he considers *C. cocles*, *C. formosa* and *C. carli* to be all phases of one species, and certainly there is much to impress this view, which if accepted must also include and synonymically sink several other described "species." Actual breeding must, however, decide this question, and at present I treat them here as distinct. Certainly *C. cocles* is much further removed from *C. formosa* than the last named is from *C. carli*.\*

### 5. *Cyrestis perianther*. (Tab. XLI., fig. 10.)

*Papilio Perianther*, Fabricius, Mant. Ins. ii. p. 9, n. 74 (1787); Ent. Syst. iii. p. 65, n. 204 (1793); Don. Ins. Ind. t. 37, f. 1 (1800).

*Nymphalis Perianther*, Godt. Enc. Méth. ix. p. 362, n. 42 (1823).

*Paphia Perianther*, Horsf. Cat. Lep. E. I. C. t. 5, f. 3, 3a (1829).

*Cyrestis Perianther*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 147, n. 299 (1857); Butl. Cat. Fabr. Lep. p. 82, n. 2 (1869).

*Cyrestis Themire*, Honrath, Berl. Entomol. Zeitschr. Bd. xxviii. Heft 1, p. 398, t. x. f. 5 (1884).

Male and Female. Wings above creamy white; anterior wings with the following pale ochraceous fasciæ:—two near base, third not extending beneath cell, fourth crossing wing, fifth not extending beneath cell, and the sixth again crossing wing, apex and outer margin dark fuscous and containing an inner row of blackish spots and a submarginal blackish line margined on each side with greyish-white, fringe obscure greyish; posterior wings with the following pale ochraceous fasciæ,—two near base, neither of which reach the abdominal margin, the third oblique, fourth and fifth crossing wing and fused towards anal angle, a large pale ochraceous submarginal patch extending from about the discoidal nervule to the anal angle, outer margin dark fuscous with an inner series of greyish spots with blackish centres and margins situate on a blackish waved line outwardly margined with greyish, a submarginal waved blackish line margined on each side with greyish and the fringe obscure greyish. Wings beneath as above, but with the ochraceous fasciæ narrower, paler, and somewhat less continuous and more broken. Body above pale fuscous, beneath with legs more or less concolorous with wings.

Exp. wings, ♂ and ♀, 38 to 48 millim.

HAB.—Continental India; Assam (Brit. Mus.).—Malay Peninsula; Penang (Biggs & Egerton—coll. Dist.); Perak (Künstl.—coll. Honrath).—Java (Horsf. & Moore).

### Genus CHERSONESIA (*antea*, p. 142).

#### 2. *Chersonesia peraka*. (Tab. XL., fig. 6).

*Chersonesia peraka*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xiv. p. 199 (1884).

Allied to *C. rahria*, Moore, but smaller, the ground-colour more ochraceous and less rufous; markings similar, but with the transverse fasciæ broader, much darker, and placed closer together. The obsolete caudate prolongations in *C. rahria* near the apices of the first and third median nervules are scarcely visible in *C. peraka*, and a structural peculiarity exists in the first subcostal nervule of the anterior wings, which in the species I here describe impinges near its base on the costal nervule.

Exp. wings, ♂, 28 millim.; ♀, 34 millim.

HAB.—Malay Peninsula; Perak (Künstl.—Calc. Mus.).

\* The fumambulatory path of the specific discriminator is not enlightened, but rather darkened, by such unexpected problems as these poor *Cyrestids* afford. In fact, the whole canon of specific differentiation frequently partakes of the nature of the old scholastic jargon, and some future historian who may write on the classificatory system pursued by many naturalists of these days might almost use the words of the venerable—or to some flippant—Jortin D.D., who, writing of A.D. 1000, remarks:—"In this age, though dark and ignorant, a subtle question was started, relating to dialectics, concerning *universals*, as they were called, or the *genera* and *species rerum*; whether they were *realities* and *substances*, or mere *names*. . . . This controversy was warmly agitated for many ages and caused furious contentions."—('Remarks upon Ecclesiastical History.')

Genus LEBADEA (*antea*, p. 144).2. *Lebadea ismene*.

*Limenitis Ismene*, Doubleday & Hewitson, Gen. Diurn. Lep. t. 34, f. 2 (1850).

Male. Very closely allied to *L. martha*, but larger, the ground colour rufous-red, and not brownish-ochraceous; posterior wings with the discal oblique white fascia broader than in *L. martha*, and the space between the fuscous lunulate spots and the submarginal line considerably broader than in the Fabrician species.

Exp. wings, ♂, 55 to 60 millim.

HAB.—Continental India; Silhet (coll. Dist.).—Malay Peninsula; Langkawi Islands (coll. Birch and Egerton).

Genus NEPTIS (*antea*, p. 149).13. *Neptis miah*, var. (Tab. XLI., fig. 14).

*Neptis Miah*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. vol. i. p. 164, n. 339, t. 4a, f. 1 (1857); Proc. Zool. Soc. 1858, p. 4, n. 5.

Mr. Moore has thus described his species:—"Upper-side brown-black: *fore-wing* with a longitudinal streak from base of wing, an oblique transverse short apical fascia, and which nearly meets a reversely-oblique fascia on posterior margin, rufous: *hind-wing* with a nearly straight broad inner band, and a narrow submarginal band rufous. Under-side dark ferruginous: *fore-wing* with the longitudinal and oblique marks pinky-white; two narrow submarginal lines purple: *hind-wing* with inner band pinky-white; two submarginal and a less distinct middle line purple; costal margin at the base whitish."

Exp. wings, "2 $\frac{2}{3}$  inches."

HAB.—Continental India; Sikkim (de Nicéville); Darjeeling (coll. Dist.).—Malay Peninsula; Perak (Künstl.—coll. Ribbe).

A single specimen of this species from the Malay Peninsula has alone passed through my hands. This, as the figure shows, differs in some slight peculiarities—principally in the size and shape of the rufous fasciæ to the anterior wings—from typical specimens from Darjeeling; but the differences are only slight, and such as are not uncommon in other species of the genus.

In Sikkim Mr. de Nicéville found it "not rare at low elevations. I took it settled to drink on damp sand."\*

*N. miah* belongs to the section of the genus which contains *N. tiga*, and is here arranged after that species.

5 a. *Neptis vikasa*, var. *harita*. (Tab. XLIII., fig. 8).

*Neptis Harita*, Moore, Proc. Zool. Soc. 1874, p. 571, t. 66, f. 8.

I here give Mr. Moore's original description of a specimen from E. Bengal:—

"Male and female. Upperside olive-brown; fore wing with paler and rather indistinct discoidal streak and dentate disco-cellular mark; two transverse discal series of pale black-bordered zigzag lunules, and a submarginal similar lunular line; hind wing with pale narrow subbasal transverse band, with dark outer border, beyond which is a blackish fascia, and then a submarginal row of pale-bordered dark lunules (these lunules being triangular in the female). Underside olive-brown; markings as above, but whiter."

Exp. wings, "2 inches."

HAB.—Continental India; E. Bengal (Moore).—Malay Peninsula; Perak (Künstl.—coll. Ribbe).

\* J. A. S. Beng. vol. li. p. 58, n. 151 (1882).

As Mr. Moore observes, *N. harita* is closely allied to *N. vikasi*, "but may be distinguished from it by its smaller size, less distinct markings, and in the submarginal band of the hind wing being formed of distinct lunules." The last character is the only reliable one I can find, and I therefore prefer to look upon it as a varietal form only. The figure here given of *N. vikasi* has already (*antea*, p. 152) been reported as unsatisfactory.

14. *Neptis anjana*, var. (Tab. XXXVI., fig. 11.)

*Neptis Anjana*, Moore, Trans. Ent. Soc. 1881, p. 309.

The following is the original description of this species:—

"♂. Upper side very dark olivaceous-brown; fore wing with a slender, but not very prominent, ochreous-brown narrow discoidal streak, a curved discal macular band, a submarginal and a less distinct marginal line; hind wing with a slender transverse subbasal band, a recurved discal band, and narrower but less distinct marginal line. Underside dark chestnut-red; fore wing with the discoidal streak, transverse outer bands glossy purplish blue, the lower part of the discal band being pale ochreous; hind wing with two medial, two discal bands, a very slender marginal glossy purplish blue and a broad paler basal band."

Exp. wings, "2½ inches."

HAB.—Burma; Moulmein (coll. Moore).—Malay Peninsula; Perak (Künstl.—coll. Ribbe); Sungei Ujong (Durnford—coll. Dist.).

A specimen received from Sungei Ujong is here figured. I have carefully compared this specimen with Mr. Moore's Moulmein type, and find slight differences in the following particulars:—it is darker, the discal bands beneath are slightly wider apart, and the submarginal fascia is somewhat less lunular; but all these differences are not constant, as a Perak specimen in the collection of Herr Ribbe is much lighter in hue.

*N. anjana* is here arranged after *N. vikasi*.

Genus ATHYMA (*antea*, p. 156).

6. *Athyma kresna* (*antea*, p. 161).

Since describing the female as differing in "no essential respects from the male," the only distinguishing character being that in the female the cellular streak of the anterior wings is apparently never broken, Mr. Moore has pointed out to me that this female represents his *A. kanwa*,\* and he considers the true female to be a yellow and brown form, much like the corresponding sex of *A. nefte*, or again it may be his *A. subrata* (*antea*, p. 164), of which also female specimens are alone known. Breeding must decide this point, and my own opinion leans to the supposition that all these three distinctly marked females belong to *A. kresna*, and are trimorphic varieties of that species.

Genus HYPOLIMNAS (*antea*, p. 164).

4. *Hypolimnas anomala* (*antea*, p. 169). (Tab. XLI., f. 1, 2 ♂: 3, 4 ♀.)

Since giving the description of the above species I have received a fair series of specimens, and am now able to give figures of both sexes. It is, like most of the other members of the genus, a very variable species.

\* Proc. Zool. Soc. 1858, p. 17, n. 17. t. 51, f. 2.

Additional HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.); Province Wellesley (Birch); Perak (Künstl.—Calc. Mus.); Sungei Ujong (Durnford—coll. Dist.); Singapore (Kerr—coll. Dist.).—Borneo; Sandakan (coll. Pryer).

From information contained in a letter sent me by Mr. J. K. Birch, this species appears to be not uncommon in some parts of Province Wellesley in the month of December.

Genus HESTINA (to follow HYPOLIMNAS).

*Hestina*, Westwood, *Diadema*, sect. 6, Gen. Diurn. Lep. p. 281 (1850).

This genus may be synoptically separated from *Hypolimnas*, with which it has considerable affinity, by the character of the cells of both wings being open and not closed by a disco-cellular nervule.

The distribution of this genus appears to be focussed in Northern India, and it is also found in China.

1. *Hestina nama*. (Tab. XLIII., fig. 9 ♂).

*Diadema Nama*, Doubleday, Ann. Nat. Hist. xvi. p. 232 (1845); Doub. & Hew. Gen. Diurn. Lep. t. 39, f. 2 (1850).

*Hestina nama*, De Nic. J. A. S. Beng. vol. L. p. 50, n. 25 (1881); *ibid.* vol. li. p. 58 (1882).

Male. Anterior wings above very dark indigo-blue, with the following pale bluish markings:—a basal streak in cell, followed by two spots, and two other similar spots at end of cell, a curved discal series of six linear spots placed between the nervules, the lowermost longest and duplex; beyond these are an irregular cluster of spots, with a distinct submarginal series, basal two-thirds of inner margin pale bluish. Posterior wings creamy with a bluish tinge, the neuration and a broad outer margin castaneous, the last containing some dark spots which are inwardly margined by some small pale creamy spots, extreme outer margin sublunulate and paler in hue. Anterior wings beneath as above, but the ground colour of the apical area ferruginous; posterior wings beneath as above, but paler, and with the outer sublunulate spots creamy white and with three somewhat large subapical spots of the same colour. Body above dark indigo-blue; head and anterior portion of pronotum spotted with creamy-white, lateral margins of pronotum pale bluish-grey; body beneath thickly spotted with creamy-white; abdomen with a lateral stripe of the same colour on each side; legs streaked with creamy-white.

Exp. wings, ♂, 85 to 90 millim.

HAB.—Continental India; Sikkim (de Nic.).—Malay Peninsula; Perak (Egerton—coll. Dist.).

The exertions of Mr. W. Egerton have enabled me to add this butterfly to the list of species composing our rhopalocerous fauna. My collection contains male specimens only, and Mr. de Nicéville narrates his collecting experiences in Sikkim with reference to this species as “males only taken on the lower hills. On the wing it much resembles *Danaïs tytia*.”\*

Genus CETHOSIA (*antea*, p. 170).

4. *Cethosia biblis*. (Tab. XXXVIII., fig. 3 ♂.)

*Papilio Biblis*, Drury, Ill. Ex. Ent. i. t. 4, f. 2 (1773); Cram. Pap. Ex. ii. t. 175, A, B (1779).

*Alazonia Symbiblis*, p., Hübn. Verz. bek. Schmett. p. 46, n. 421 (1816).

*Cethosia Biblina*, Godt. Enc. Méth. ix. p. 248, n. 12 (1819).

*Cethosia Biblis*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 153, n. 317 (1857); De Nic. J. A. S. Beng. vol. L. p. 50, n. 14 (1881).

\* This of course does not necessarily imply that one species mimics the other, though such is probably the case. In forming these likely conclusions one is reminded of the apothegm of Bacon:—“The Lord St. Albans, who was not over hasty to raise theories, but proceeded slowly by experiments, was wont to say to some philosophers, who would not go his pace, ‘Gentlemen, nature is a labyrinth, in which the very haste you move with will make you lose your way.’”

This species is here perhaps best described by a differential comparison with *C. logani* (*antea*, p. 170):—

Male. Allied to *C. logani*, but wanting the large subquadrate white spots between the first and third median nervules of the anterior wings; the black margin to the posterior wings is narrower, and is preceded by a linear black macular fascia, and the marginal lunulate linear spots are much brighter in *C. biblis*. On the under surface of the wings the pale fasciæ are narrower and more regular than in *C. logani*.

Female. Wings paler and more ochraceous than in male.

Exp. wings, ♂ & ♀, 62 to 85 millim.

HAB.—Continental India; Sikkim (de Nic.); Cachar (coll. Dist.); Darjeeling (Horsf. & Moore).—Malay Peninsula; Perak (Künstl.—Calc. Mus.).

Mr. de Nicéville, who has had more than the usual experience of collecting in Sikkim, remarks:—"The rich red of its upper surface with a long violet reflection makes this species one of the handsomest insects on the wing I know."\*

#### Genus CIRROCHROA (*antea*, p. 177).

##### 6. *Cirrochroa rotundata* (*antea*, p. 181). (Tab. XLI., fig. 12 ♀).

Since enumerating this species I have received an undoubted female specimen, which I have here figured (Tab. XLI., fig. 12). It is thus apparent that Mr. Butler mistook the sex of his type specimen (which I previously figured—Tab. X., fig. 10), and that it was the male sex. As I followed the error, the correction will be, (Tab. X., fig. 10 ♂; Tab. XLI., fig. 12 ♀).

Additional HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.).

#### Genus PADUCA (*to follow CIRROCHROA*).

*Paduca*, Moore, List Lep. Mergui Archipel. Journ. Linn. Soc. 1886.

Mr. Moore, who has just proposed this genus, and given me the above reference to its forthcoming publication, has also favoured me with the following diagnosis:—

"Male. Wings narrower than in *Cirrochroa*, fore wings more triangular in form; fourth subcostal further from the third; disco-cellular inwardly oblique; two upper medians at a short distance beyond the cell. Venation of hind wings very similar, the inner submedian straighter. Antennæ with a much stouter and shorter terminal club; palpi narrower."

"Type. *P. fasciata*."

##### 1. *Paduca fasciata*. (Tab. XL., fig. 12.)

*Atella Fasciata*, Felder, Wien. Ent. Mon. iv. p. 236, n. 83 (1860).

*Cirrochroa Fasciata*, Feld. Wien. Ent. Mon. v. p. 301, n. 14 (1861); Reise Nov. Lep. iii. t. 49, f. 9, 10 (1866); Druce, Proc. Zool. Soc. 1873, p. 342, n. 3.

Male and Female. Wings above dark brown; anterior wings with the following pale stramineous markings:—a moderately broad discal, oblique fascia, commencing between the two upper median nervules and terminating on inner margin, two spots a little beyond end of cell, a submarginal series of spots, the uppermost situate between the discoidal nervules, and the lowermost with an inner blackish spot, these are followed by an outer series of lunules, which margin the innermost of two dark fasciæ; posterior wings with an oblique discal fascia continuous to that on upper wings, an outer discal macular fascia

\* J. A. S. Beng. vol. L. p. 50 (1881).

inwardly margined with small black spots, with lunules and dark marginal fasciæ as on anterior wings. Wings beneath very much paler than above, the stramineous areas more nearly confluent in the male.

Exp. wings, ♂ & ♀, 40 to 48 millim.

HAB.—Mergui Archipelago (coll. Anderson).—Malay Peninsula; Province Wellesley (Birch—coll. Dist.); Perak (Künstl.—Calc. Mus.); Larut (Durnford—coll. Dist.).—Borneo (Druce); Sandakan (Pryer—coll. Dist.).—Philippine Islands; Mindoro (Felder).

### Fam. ERYCINIDÆ (*antea*, p. 185).

#### Subfam. LIBYTHÆINÆ.

*Libythæina*, Bates, Journ. Ent. ii. p. 176 (1864); Moore, Lep. Ceyl. vol. i. p. 67 (1881); Marsh. & de Nic. Butt. India, Burm. & Ceyl. vol. i. 18 (1882).

*Libythæide*, Westw. Gen. Diurn. Lep. p. 412 (1851); Godm. & Salv. Biol. Centr. Amer. Rhop. vol. i. p. 359 (1884).

This subfamily of the *Erycinidæ* is at once distinguishable from the *Nemeobiinæ* by the great development of the palpi, which are very long and protruding, and united at their apices, thus forming a long conical beak. The pupa is also freely suspended by the tail.

The species of *Libythæinæ* are apparently well included in one genus, and are not only distributed in the temperate and tropical portions of the Old World, but are also found in the Neartic and Neotropical Regions. None, however, have been recorded from Australia or the Islands of the Pacific.

#### Genus LIBYTHEA.

*Libythea*, Fabricius, Ill. Mag. vi. p. 284 (1807); Latr. Enc. Méth. ix. p. 10 (1819); Westw. Gen. Diurn. Lep. p. 412 (1851); Moore, Lep. Ceyl. vol. i. p. 67 (1881); Godm. & Salv. Biol. Centr. Am. Rhop. vol. i. p. 359 (1884).

*Hecaerge*, Oelsenh. Schmett. Eur. iv. p. 32 (1816); Hübn. Verz. bek. Schmett. p. 100 (1816).

*Chilea*, Billb. Enum. Ins. p. 79 (1820).

As this genus represents the subfamily, the diagnostic characteristics already given for the *Libythæinæ* are equally applicable to the genus *Libythea*, and need not be recapitulated.

#### 1. *Libythea myrrha*. (Tab. XLII., fig. 2.)

*Libythea Myrrha*, Godart, Enc. Méth. ix. p. 171, n. 4 (1819); Boisd. Sp. Gén. i. t. 10, f. 8 (1836); Gray, Lep. Ins. Nep. t. 12, f. 4 (1846); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 240, n. 518 (1857); Wall. Trans. Ent. Soc. 1869, p. 335, n. 1; Druce, Proc. Zool. Soc. 1873, p. 347, n. 1; Moore, Proc. Zool. Soc. 1878, p. 832; *ibid.* 1882, p. 243.

*Hecaerge Myrrha*, Hübn. Zutr. Ex. Schmett. f. 789, 790 (1832).

Wings above very dark chocolate-brown; anterior wings with a broad longitudinal streak passing along the median nervure and continued towards outer margin, and two subapical spots—sometimes separate, but generally connected, at their angles—reddish-ochraceous; posterior wings with a broad central reddish-ochraceous fascia which is angulated near apex. Anterior wings beneath much paler than above, the longitudinal fascia broader, the subapical spots distinctly separated, the apex with a violaceous tinge; posterior wings beneath violaceous, thickly mottled with dark strigæ, a dark purplish patch near apex, and the central fascia as above pale and obscurely seen beneath. Body and legs more or less concolorous with wings.

Exp. wings, ♂, 50 millim.

HAB.—Continental India; N.W. Himalaya (Hocking—Moore); Darjeeling (Horsf. & Moore).—Burma; Moulmein (Limborg—Moore).—Tenasserim; Meetan, Hatsiega (Limborg—Moore).—Malay Peninsula; Perak (Goodrich & Egerton—coll. Dist.).—Borneo (Druce).

The Rev. J. H. Hocking describes this species as “a tree-perching insect. Settles with vertical wings.”\*

Subfam. NEMEOBIINÆ (*antea*, p. 186).

Genus ABISARA (*antea*, p. 188).

7. *Abisara neophron*. (Tab. XXXVI., fig. 6.)

*Sospita Neophron*, Hewitson, Ex. Butt. ii. *Sosp.* t. 1, f. 3 (1861).

*Abisara Neophron*, Moore, Proc. Zool. Soc. 1878, p. 833.

Mr. Hewitson thus describes his species:—

“Upperside. Male rufous-brown. Anterior wing crossed transversely at the middle by a broad band of white, and obliquely beyond the middle by a narrow, obscure, rufous band. The outer margin pale from the middle to the anal angle, traversed by a dark line. Posterior wing tailed. Crossed beyond the middle and near the outer margin by waved rufous bands. Two large black spots at the apex, separated by a line of orange. A submarginal band of white traversed by a black line. The tail white.”

“Underside as above.”

Exp. wings, “ $2\frac{1}{16}$  in.”

HAB.—Continental India; Silhet (coll. Hewits.).—Tenasserim; Moolai (Limborg—Moore).—Malay Peninsula; Perak (Künstl.—coll. Anderson).

This species will here follow *A. savitri*.

8. *Abisara telesia*. (Tab. XL., figs. 2 ♂, 3 ♀.)

*Taxila Telesia*, Hewitson, Ex. Butt. ii. *Tax.* t. 1, f. 1, 2 (1861); Journ. Linn. Soc. Zool. viii. p. 119 (1865);

Druce, Proc. Zool. Soc. 1873, p. 347, n. 5.

“Upperside. Male dark brown. Anterior wing with the apex and outer margin carmine, the inner margin produced, rounded, with near its middle an oval spot of lilac-white.”

“Underside carmine, with bands and spots of blue and black. Anterior wing with the apex rufous; a longitudinal and transverse band within the cell blue, a second transverse band also blue, followed by five blue spots, bordered inwardly with black. The inner margin where the wings touch, light yellow. Posterior wing with numerous black and blue spots. Crossed near the outer margin by a band of light blue and a band of light yellow, each bordered with black, and separated by a band of the same colour.”

Female. Anterior wings above carmine, with some scattered discal pale brownish markings and some irregular subapical greyish shadings; posterior wings pale brownish, with marginal and submarginal dark fasciæ, the upper two median and the discoidal nervules shaded with pale carmine. Wings beneath as in male.

Exp. wings, ♂ & ♀, 40 to 42 millim.

HAB.—Malay Peninsula; Perak (Künstl.—Calc. Mus.).—Sumatra (coll. Hewits.).—Borneo (Druce); Sarawak (Hewits.).

6. *Abisara damajanti* (*antea*, p. 192). (Tab. XL., fig. 10 ♂, 11 ♀.)

Since enumerating this species I have been enabled to figure what appear to be both sexes.

HAB.—Malay Peninsula; Perak (Künstl.—Calc. Mus.).

\* Proc. Zool. Soc. 1882, p. 243.

## Genus SIMISKINA (to follow ABISARA).

*Simiskina*, Distant, 'Entomologist,' vol. xix. p. 12 (1886).

This genus differs from *Abisara* in having the lower disco-cellular nervule of the posterior wings much longer than the upper, thus resembling *Stiboges*; but from that genus it is easily distinguished by the subcostal nervules of the posterior wings, which bifurcate before the upper end of cell. In shape of wings and general superficial features *Simiskina* resembles *Abisara*.

1. *Simiskina fulgens*. (Tab. XLII., fig. 3.)

*Simiskina fulgens*, Distant, 'Entomologist,' vol. xix. p. 12 (1886).

Wings above bright ochraceous; anterior wings with the apex, and outer and inner margins, broadly dark brownish, with a narrow linear disco-cellular spot of the same colour; posterior wings with the cellular area, the whole area between cell, upper median nervule, and abdominal margin, and a broad outer macular margin, dark brownish. Wings beneath pale ochraceous; both wings with linear pale castaneous disco-cellular spots, a much-waved castaneous fascia crossing the wings beyond cells, recurved, and terminating on abdominal margin of posterior wings; two fainter outer discal fasciæ, the outermost of which is blackened on posterior wings; outer margin pale castaneous on posterior wings, preceded by two dark linear fasciæ. Body above fuscous; beneath more or less concolorous with wings.

Exp. wings, 36 millim.

HAB.—Malay Peninsula; Penang (Goodrich—coll. Dist.); Malacca (coll. Staud.).

Fam. LYCÆNIDÆ (*antea*, p. 193).—Group CURETARIA (*antea*, p. 196).

Genus PORITIA (*antea*, p. 197).

In my diagnosis of this genus I stated that "according to my view there are three" subcostal nervules to the anterior wings. Mr. Moore has since pointed out to me that there are four, the first being very short and minute.

8. *Poritia pharyge*. (Tab. XLI., fig. 8.)

*Poritia Pharyge*, Hewitson, Trans. Ent. Soc. 1874, p. 345; Ill. Diurn. Lep., Lye., p. 215, t. 88, f. 8, 9 (1878).

Wings above blackish, with the following bluish-green markings; anterior wings with a longitudinal fascia along the median nervule, a curved fascia on base of inner margin, three subapical spots and a marginal series of six spots; posterior wings with a longitudinal fascia along the submedian nervule, two discal and three marginal spots; costal area of posterior wings brownish. Wings beneath brownish; anterior wings with a dark linear disco-cellular spot, followed by two linear fasciæ crossing wing which are more or less margined with greyish; posterior wings with a dark linear disco-cellular spot, two discal narrow waved dark fasciæ more or less margined with greyish, a similarly coloured and margined waved fascia extending from the upper median nervule to anal angle, and a marginal narrow bluish and black fascia at the same area.

Exp. wings, 28 millim.

HAB.—Malay Peninsula; Perak (Künstl.—coll. Ribbe).—Borneo (coll. Hewits.).

## Genus DERAMAS.

*Deramas*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xvii. p. 252 (1886).

This genus is closely allied to *Poritia*, but differs by possessing *five* subcostal nervules in the anterior wings; of these the first is very short, emitted at about one-third before the end of cell, and joins the



costal nervure; second emitted nearer first than third; third from end of cell; fourth bifurcating from third at about half its length; fifth bifurcating from third about midway between base of fourth and apex of wing.

1. *Deramas livens*. (Tab. XLII., fig. 15 ♂.)

*Deramas livens*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xvii. p. 252 (1886).

Male. Wings above dark ærúlean-blue; anterior wings with the neuration, costal, cellular, and apical areas, outer margin narrowly, to outer angle, and inner margin narrowly dark fuscous; posterior wings with a cellular tuft of long hairs, costal and abdominal areas, posterior margin, and a more or less continuous series of marginal spots placed on the nervules dark fuscous. Wings beneath pale brownish ochraceous; both wings with a narrow, linear, much waved and dislocated castaneous fascia, between which and outer margin the colour is much suffused with greyish; posterior wings with a short, narrow, strongly waved linear blackish fascia at anal angle. Body and legs more or less concolorous with wings.

Exp. wings, 30 millim.

HAB.—Malay Peninsula; Singapore (coll. Godfery).

Genus CURETIS (*antea*, p. 201).

2. *Curetis æsopus* (*antea*, p. 202). (Tab. XLIV., fig. 14 ♀.)

I am now able to figure the female of this species, of which the original description has previously been given.

Additional HAB.—Malay Peninsula; Perak (coll. Dist.).

5. *Curetis insularis*. Tab. XLI., figs. 6 ♂, 7 ♀.)

*Phædra Insularis*, Horsfield, Cat. Lep. E. I. C. p. 125, n. 52 (1829).

*Anops Insularis*, Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 53, t. 1*a*, f. 14 (1857).

Male. Wings above shining sanguineous; anterior wings with the base brownish, the costal, apical and outer marginal areas black; posterior wings with the outer margin black, the basal, abdominal and anal-angular areas brownish. Wings beneath pale creamy-white, with a stramineous tinge, both wings crossed beyond cells by a waved and more or less broken linear blackish fascia inwardly margined with bluish-grey, and both wings with a submarginal series of small black spots. Body above dark brownish; body beneath more or less concolorous with wings.

Female.—Wings above dark chocolate-brown; anterior wings with a large discal orange-yellow patch which occupies the lower portion of cell, is continued beneath cell, and extends to a short distance from outer margin; posterior wings with a small curved orange-yellow patch extending from upper subcostal nervule to about end of cell. Wings beneath as in male.

Exp. wings, ♂ and ♀, 35 millim.

HAB.—Malay Peninsula; Perak (Künstl.—coll. Dist.); Selangor; Kwala Lumpor (Biggs—coll. Dist.).—Java (Horsfield).

This species is here arranged after *C. felderi*.

Genus PARAGERYDUS (*antea*, p. 207).

Mr. Butler has recently expressed his opinion\* that Felder's genus *Allotinus* is synonymic with *Paragerydus*, for the reason that he proposes *A. fallax*† as the type of *Allotinus*, whilst I have taken *A. subviolaceus* as the typical species.

\* Ent. Month. Mag. vol. xxii. p. 59 (1885).

† A species found in the Philippine Islands.

Genus LOGANIA (*antea*, p. 208).2. *Logania sriwa*. (Tab. XLIV., fig. 16.)

*Logania sriwa*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xvii. p. 531 (1886).

Wings above violaceous-white; anterior wings with the costal margin spotted with fuscous and the apical area (not quite reaching to outer angle) dark fuscous; posterior wings with the fringe spotted with fuscous. Wings beneath fuscous-brown with darker blotches, and irrorated and speckled with greyish-white; this whitish coloration is most prominent on the anterior wings at apex and outer angles, and on the posterior wings it appears as an irregular broad subcostal streak: the posterior wings are also more darkly marked than the anterior. Body above brownish, beneath greyish; legs very pale brownish with dark annulations.

Exp. wings, 24 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).

Genus ALLOTINUS (*antea*, p. 208).

Mr. Butler's interpretation of this genus has already been referred to (*antea*, p. 451).

8. *Allotinus alkamah*, *n. sp.* (Tab. XLIV., fig. 3 ♂.)

Male. Allied to *A. subviolaceus*, Felder,\* from which it differs by the much larger violaceous area to the anterior wings, and consequent considerable diminution in the width of the blackish margin to the same. Wings beneath as in *A. subviolaceus* (judging from Felder's figure), but having some distinct short transverse darker strigæ.

Female. Resembling the male, but the posterior wings paler and more violaceous.

Exp. wings, ♂, 26 millim.; ♀, 35 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).—Sumatra (Forbes—coll. Dist.).

Genus CYANIRIS (*antea*, p. 210).3. *Cyaniris jynteana*, *var.* (Tab. XLIV., fig. 6 ♂.)

*Cyaniris jynteana*, Moore, Proc. Zool. Soc. 1883, p. 524, t. 48, f. 10; De Nic. J. A. S. Beng. vol. lii. p. 69, n. 5, t. 1, f. 7, 7a (1884). †

“Near *C. puspa*. *Male*.—Fore wing comparatively shorter, the blue less intense and slightly paler; the discal area slightly white speckled; with a blackish outer marginal band of one-twelfth inch in width; hind wing with a narrow macular marginal band. Underside greyish white; fore wing with a slender indistinct dusky-black discocellular streak, four transverse discal, outwardly oblique, short linear spots, a small costal spot, a submarginal and marginal row of lunular spots; hind wing with three small black subbasal spots, an irregular discal transverse series of nine spots, an indistinct submarginal and marginal row of dentate lunular spots.”

The above is Mr. Moore's description of the male, the following is Mr. de Nicéville's description of the other sex:—

“*Female*.—Upperside, *forewing* with all but the middle of the disc (which is white glossed with iridescent blue) black; a discocellular black spot. *Hindwing* blackish, white in the middle, glossed with blue, and along the veins irrorated with black scales; a submarginal series of pale lunules. Underside marked exactly as in the male.”

\* A Javan species.

† Both Mr. Moore and Mr. de Nicéville seem to have described this species *under the same name* at about the same time. Mr. Moore's description, however, has priority, as the portion of the 'Journal of the Asiatic Society of Bengal' in which Mr. de Nicéville's contribution appeared, though bearing date 1883, was really delayed in publication till 1884.

Exp. wings, ♂, "1½ to 1¾ inch" (Moore); ♀, ".9 to 1.25 inches" (de Nic.).

HAB.—Continental India; Khasia and Jyntea Hills (Moore); Sikkim, Shillong (de Nic.).—Malay Peninsula; Malacca (coll. Staudinger).

A single male Malaccan specimen in the collection of Dr. Staudinger forms my only knowledge of this species from the Peninsula. Although this specimen differs from the typical form of the species by the darker colouring of the anterior wings, and especially by the brownish hue of the posterior wings, it was yet identified without doubt by Mr. Moore himself as representing his *C. jynteaana*. When one compares the figures of this species given by Messrs. Moore, de Nicéville, and myself, the difficulty of properly portraying the colour of these small *Lycenidae* (either by hand-colouring or chromo-lithography) becomes painfully apparent. This difficulty, however, is scarcely detrimental to determination, for the markings beneath, *on which true identification depends*, will be seen to be uniform and unmistakable.

That the species is variable is shown by the following remarks of Mr. de Nicéville:—  
"Four male and two female specimens of this species were taken by me at different elevations in Sikkim in October. The males differ in size, in the absence in two of them of the white patch on the disc of the forewing on the upperside, and also in the width of the marginal black border, which in some specimens disappears at the hinder angle. The underside is very constant, all the spots and markings being very small and distinct."\*

#### 4. *Cyaniris placida*. (Tab. XLIV., fig. 7 ♂.)

*Cyaniris placida*, Moore, Proc. Zool. Soc. 1883, p. 523, t. 48, f. 5; De Nic. J. A. S. Beng. vol. lii. p. 68, n. 3, t. 1, f. 8 (1883).

"Allied to *C. lavenderis*.† *Male*.—Upperside of a darker but duller blue, and of an uniform tint throughout, *C. lavenderis* having the discal area of both wings slightly whitish; marginal black borders similar but slightly narrower. Underside similarly marked, except that in the fore wing there are but four transverse discal spots, which are also disposed in a more linear series."

Exp. wings, "1¾ inch."

HAB.—Continental India; Darjeeling (coll. Moore); Sikkim; Sibsagar, Upper Assam (de Nic.).—Malay Peninsula; Penang (Biggs—coll. Dist.).

A single specimen of this species, collected by the Rev. L. Biggs in Penang, has alone reached me from the Peninsula. Mr. de Nicéville writes that it is very common in Sikkim; he "took it at various elevations in October, and Mr. Otto Möller has taken it in large numbers in the spring."

#### 5. *Cyaniris sp.?* (Tab. XLIV., fig. 10 ♀.)

I am unable to definitely identify this species, and having but one specimen of one sex before me at present, and judging that such may most probably prove to be the female of some other described species, I here merely figure and draw attention to it.

Exp. wings, ♀, 30 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).

\* J. A. S. Beng. vol. lii. p. 69.

† A Ceylonese species.

Genus ZIZERA (*antea*, p. 212).3. *Zizera pygmea*.*Lycana Pygmea*, Snellen, Tijds. Ent. xix. p. 153, t. 7, f. 3 (1876).*Zizera Pygmea*, Moore, Lep. Ceyl. vol. i. p. 79, t. 35, f. 5, 5a (1881).FIG. 126.—*Zizera pygmea*.

Male. Wings above resembling *Z. lysizone*. Wings beneath pale greyish-brown; anterior wings with nine dark spots margined with greyish, one long and linear at end of cell, the rest smaller, two subcostal, and six submarginal; posterior wings with a linear disco-cellular spot at end of cell, a series of ten spots in circular discal series, two similar spots situate one in and one beneath cell, and two small contiguous spots at base; both wings with two marginal brownish linear sublunulate fasciæ, the outermost broadest, and both margined with greyish, a blackish marginal line and the fringe greyish-brown.

Exp. wings, 20 millim.

HAB.—Ceylon (Thwaites—coll. Dist.).—Malay Peninsula; Singapore (coll. G. F. Mathew).—Java; Batavia (Snellen).

This species was captured at Singapore by Mr. Gervase F. Mathew, R.N., and is, so far as I am aware, the only record of it from the Peninsula.

4. *Zizera? usta*. (Tab. XLIV., fig. 5.)*Zizera? usta*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xvii. p. 531 (1886).

Wings above violaceous-brown. Wings beneath greyish-ochraceous; anterior wings with two contiguous fuscous spots at centre of cell, a fuscous discocellular spot at end of cell, and five spots of the same colour in a curved submarginal series; posterior wings with two large black spots near costal margin, the outermost with a small fuscous spot beneath it, a small fuscous spot in cell, and a disco-cellular streak of the same colour at end of cell, and with the following blackish spots:—one beneath and near base of cell, two near abdominal margin, one near anal angle, and four in a curved series beyond cell, and with a double series of pale fuscous, linear, submarginal spots; fringe of both wings fuscous. Body and legs more or less concolorous with wings.

Exp. wings, 20 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).

I place this species provisionally in the genus *Zizera*, from which it differs by having the first subcostal nervule completely anastomosed with the costal nervule. The typical specimen, however, is not only unique, but also not my own property, thus preventing that detailed structural examination which is necessary for exact generic determination, but which is liable at the same time to injure the specimen.

Group CASTALARIA (*antea*, p. 214).—Genus NACADUBA (*antea*, p. 218).1. *Nacaduba macrophalma* (*antea*, p. 218). (Tab. XLIV., fig. 8 ♀.)

I am now able to figure the female of this species, and at the same time to portray more carefully the markings on the under surface of the anterior wings than they are represented by the figure of the male specimen previously given.

This female specimen is from Malacca, and is in the collection of Dr. Staudinger.

7. *Nacaduba kerriana*. (Tab. XLIII., fig. 12.)

*Nacaduba kerriana*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xvii. p. 253 (1886).

Wings above pale lavender-blue; anterior wings with the costal margin narrowly and the outer margin more broadly fuscous; posterior wings with the outer margin fuscous, and with marginal fuscous spots separated by the median nervules, and which are divided from the outer margin by narrow greyish, linear markings; tail-like appendages fuscous, with the apices greyish-white. Wings beneath pale greyish-brown; anterior wings with the following whitish fasciæ:—one crossing cell just before apex, and extending from subcostal nervure to near inner margin; a short disco-cellular fascia just beyond end of cell, preceded by a small spot between the second and third subcostal nervules; these are followed by a fascia which nearly crosses the whole breadth of wing, commencing at second subcostal nervule and extending to near inner margin, the outermost fascia being shorter and commencing at lower subcostal nervule terminates on second median nervule; outer margin broadly whitish, containing a double series of dark fuscous spots, extreme margin dark fuscous; fringe brownish: posterior wings crossed by a series of whitish fasciæ, the outer margin as on anterior wings with two marginal black spots, which are separated by the second median nervule and are irrorated by bluish scales and preceded by ochraceous shading. Body above and beneath more or less concolorous with wings; legs fuscous, streaked with greyish.

Exp. wings, 35 millim

HAB.—Malay Peninsula; Malacca (coll. Staud.); Singapore (Kerr—coll. Dist.).

I am indebted to Major Kerr for a single specimen of this species, which is probably not so very rare, but requiring its localities and times of appearance to be discovered.

Genus EVERES (*antea*, p. 221).2. *Everes exiguus*, *n. sp.* (Tab. XLIV., fig. 17 ♀.)

Female. Wings above pale dusky-brown, the basal areas more or less shaded with violaceous-blue; posterior wings with a submarginal broken lunate greyish fascia and a marginal series of blackish spots margined with greyish, the spot between the two lower median nervules inwardly margined with reddish-ochraceous; fringe greyish. Wings beneath greyish-brown: anterior wings with three discal greyish-margined fasciæ, the first short at end of cell, the second extending from the bifurcation of the fourth and fifth subcostal nervules to the second median nervule, the third commencing at that nervule, its outer margin being connected with the inner margin of the second fascia, a submarginal greyish-margined fascia, and a small subcostal greyish-margined spot on the inner side of the second discal fascia. Posterior wings with three discal greyish-margined fasciæ, the first shortish at end of cell, the second longest and reaching the second median nervule, the third commencing at that nervule, its inner margin connected with the outer margin of the first, two greyish-margined spots at base, one in and one beneath cell, beyond the outer fascia is a greyish lunulate line, and a marginal series of greyish-bordered spots, the spots between the two lower median nervules broadly margined inwardly with reddish-ochraceous, and a small ochraceous spot at anal angle; two black grey-margined subcostal spots. Body and legs more or less concolorous with wings.

Exp. wings, ♀, 21 millim.

HAB.—Malay Peninsula; Singapore (Kerr—coll. Dist.).

This is another species represented by a single female specimen sent to me by Major Kerr from Singapore. I have been compelled to name and describe it in order that it might appear here.

Genus CATOCHRYSOPS (*antea*, p. 223).

2. *Catochrysops cnejus* (*antea*, p. 225). (Tab. XLIV., fig. 15 ♀.)

I am now able to figure the female of this species, of which the description has been previously given. The figure represents a Malaccan specimen in the collection of Dr. Staudinger.

Genus LAMPIDES (*antea*, p. 226).

2. *Lampides ælianus* (*antea*, p. 228.)

*Plebeius Malaccanus*, Röber, 'Iris,' i. p. 57, t. 4, f. 3 (1886).

Herr Röber appears to have described one of the varieties of *L. ælianus* (apparently my var. *b*) as a distinct species.

5. *Lampides optimus*.

*Plebeius Optimus*, Röber, 'Iris,' i. p. 56, t. 4, f. 16 (1886).



FIG. 127.—*Lampides optimus*.

“♂. Oberseite weissblau, die weisse Zeichnung der Unterseite durchscheinend; Aussenrand der Vdrfl. graubraun; Htrfl. mit dunkler Saumlinie und weissen, an den Rippen dunklen Fransen; Schwänzchen mit weisser Spitze; Innenrand der Htrfl. weisslich.”

“Unterseite hellrehgrau mit weissen Zeichnungen; der schwarze Fleck zwischen  $M_1$  und  $M_2$  der Htrfl. nach innen breit rothgelb begrenzt, an den Seiten metallischgrün bestäubt; im Analwinkel ein kleiner schwarzer, nach innen rothgelb begrenzter Fleck; Innenrand der Vdrfl. weisslich.”

“Flügelspannung: 27 mm.”

“♀: Oberseite der Vdrfl. mit breitem, schwarzgranem Aussenrande; am Aussenrande der Htrfl. eine Reihe dunkler, weiss umzogener Flecken.”

“Unterseite wie beim ♂.”

“Flügelspannung: 27 mm.”

“Thorax bläulich; Hinterleib oben dunkel, unten weisslich; Brust desgl.; Fühler schwarz, weiss geringelt; Palpen oben schwarz, unten weiss; Beine aussen schwarz, innen weiss, Tarsen schwarz geringelt.”

HAB.—Malay Peninsula; Perak (Röber).—Borneo (coll. Dist.).—Celebes (Röber).

This species will here follow *L. ælianus*.

6. *Lampides abdul*, *n. sp.* ♀. (Tab. XLIV., fig. 22.)

Female. Wings above pale cerulean-blue; anterior wings with the costal and outer margins—the last very broadly—pale brownish, the outer margin with some indistinct greyish fasciæ; posterior wings shaded with pale brownish as on anterior wings, but the outer margin broader, with some black spots with bluish margins at anal angle. Wings beneath pale greyish-brown; anterior wings with two greyish-white fasciæ crossing wing at end of cell commencing at subcostal nervure, followed by two shorter fasciæ commencing near lower subcostal nervule and terminating on the first and second median nervules respectively, and two submarginal and a marginal fascia of the same colour; posterior wings crossed by greyish fasciæ, a black marginal spot inwardly margined with ochraceous between the two lower median

nervules, and a small patch of greenish scales preceded by ochraceous at anal angle. Body and legs more or less concolorous with wings.

Exp. wings, ♀, 26 millim.

HAБ.—Malay Peninsula; Malacca (coll. Staudinger).

A single female of this distinct species was in the collection of Malaccan specimens submitted to me by Dr. Staudinger.

#### Genus POLYOMMATUS (*antea*, p. 230).

##### 2. *Polyommatus bagus*. (Tab. XLIV., fig. 13.)

*Polyommatus bagus*, Distant, Ann. & Mag. Nat. Hist. ser. 5, vol. xvii. p. 532 (1886).

Female. Wings above closely resembling those of the same sex of *P. bœticus*. Wings beneath pale brownish ochraceous, with the following linear brownish fasciæ margined with greyish:—both wings with two at end of cells and two submarginal fasciæ, the innermost broadest; posterior wings with two large, marginal, blackish spots, containing a few scattered greenish scales, inwardly margined with pale reddish-ochraceous, and separated by the lower median nervule. Body above more or less concolorous with wings, beneath with legs greyish-white; legs more or less streaked with brownish.

Exp. wings, ♀, 30 millim.

HAБ.—Malay Peninsula; Province Wellesley (Birch—coll. Dist.).

I am indebted to Mr. J. K. Birch for a specimen of this very interesting species.

#### Genus MEGISBA.

*Megisba*, Moore, Lep. Ceyl. vol. i. p. 71 (1881).

This genus is allied to *Polyommatus* by having the first subcostal nervule of the anterior wings free and not anastomosed with, nor impinging on, the costal nervule, and like that genus the posterior wings possess a single filamentous tail-like appendage. The other characters relied upon by Mr. Moore are in the anterior wings:—"first subcostal branch emitted at nearly one-half length before end of the cell, second at one-third before its end, third at one-eighth, the fourth at one-half beyond and terminating before the apex; discocellulars very slender; middle median branch emitted immediately before end of the cell, lower at one-half before its end; submedian straight; hindwing convex at the apex, oblique towards anal angle, abdominal margin long; first subcostal branch emitted at one-fifth before end of the cell; two upper median branches from a short distance beyond end of the cell. Abdomen long, reaching to anal angle."

This genus has been so recently proposed that it is impossible to estimate its area of distribution, at least, until we know what species are to be included in it.

##### 1. *Megisba thwaitesi*.\* (Tab. XLIV., fig. 4.)

*Megisba Thwaitesi*, Moore, Lep. Ceyl. vol. i. p. 71, t. 34, f. 3, 3a, b (1881).

"Male and female. Upperside dark violet-brown; forewing with an oblique lower discal white-speckled patch. Cilia whitish. Underside bluish-white: forewing with four blackish spots on middle of costal border, one within the cell, a brown discocellular streak, an outer discal transverse curved series of five brown streaks, a marginal row of blackish spots bordered inwardly by a narrow sinuous line and outwardly by a linear marginal line: hindwing with three black subbasal transverse spots, one on middle

\* Named after Dr. George Henry Kendrick Thwaites, for many years the Director of the Royal Botanic Garden, Peradeniya, Ceylon, which under his management became "perhaps the most beautiful tropical garden in the world." Dr. Thwaites was also an entomologist. He died at Kandy on September 11th, 1882.

of abdominal margin and a larger one on costal border near the apex; a narrow brown discocellular streak and a discal series of irregular-shaped spots, a marginal row of blackish spots bordered within by a sinuous line and outwardly by a linear marginal line, the third spot from anal angle large and blackest. Palpi black above; legs with prominent black bands; antennæ black with white annular bands."

Exp. wings, "♂  $\frac{3}{8}$ , ♀ 1 inch."

HAB.—Ceylon; Kandy (Moore).—Malay Peninsula; Malacca (coll. Staudinger).

Mr. Moore describes the larva of this species as "light green, vermiform, middle segments swollen. Pupa thick, blunt at the ends. Feeds on Sapindaceæ."

Although at Kandy *M. thwaitesi* is reported as "very common and easy to capture,"\* one specimen only from the Malay Peninsula has up to this time passed through my hands.

#### Genus LYCÆNESTHES (*antea*, p. 232).

##### 2. *Lycænesthes bengalensis*. (Tab. XLIV., fig. 9 ♂.)

*Lycænesthes bengalensis*, Moore, Proc. Zool. Soc. 1865, p. 773, t. 41, f. 9; de Nic. J. A. S. Beng. vol. li. p. 62 (1882).

*Pseudodipsas bengalensis*, de Nic. J. A. S. Beng. vol. L. p. 55 (1881).

*Pseudodipsas bengalensis*, Druce, Proc. Zool. Soc. 1873, p. 351, n. 2.

"*Male*. Upperside dark purple-blue, exterior margin defined by a narrow suffused black line; a small indistinct black spot at anal angle; abdominal margin brown. Underside pale greyish-brown; forewing with a short transverse double white line at the extremity of the cell, enclosing the discal veinlet, beyond which are a transverse discal chain-like white band and an outer indistinct brownish submarginal and a narrow white marginal line; hindwing with basal, discoidal, and a curved discal series of chain-like white bands; an indistinct inwardly angled, double-lunulated, white marginal line; a black spot bordered above with orange-red near anal angle of exterior margin; a small white-encircled black spot on middle of abdominal margin. Head above brown; eyes encircled with white. Palpi above and beneath brown, at the sides white. Thorax, body, and legs beneath white."

"*Female*. Upperside pale purple-brown, with suffused bluish patch at the base; exterior margin suffused with darker brown; hindwing with an inner narrow white exterior marginal line. Underside as in male."

Exp. wings, "1  $\frac{1}{4}$  inch."

HAB.—Continental India; Bengal (Moore); Sikkim (de Nic.).—Malay Peninsula; Malacca (coll. Staudinger; Biggs—coll. Dist.).—Borneo (Druce).

##### 3. *Lycænesthes tessellata*. (Tab. XLII., fig. 13 ♂; Tab. XLIV., fig. 21 ♀.)

*Niphanda Tessellata*, Moore, Proc. Zool. Soc. 1874, p. 572, t. 66, f. 6.

*Lycænesthes athiops*, Dist. Ann. & Mag. Nat. Hist. ser. 5, vol. xvii. p. 253 (1886).

*Male*. Wings above dark violaceous-blue; wings beneath greyish mottled with purplish. Anterior wings with the following dark fuscous markings:—a broad basal streak beneath costal nervure extending to about middle of cell, where it is joined to a large spot which crosses and extends beneath cell; a large discocellular spot at end of cell; a curved fascia between end of cell and outer margin, extending from the second subcostal nervule to the second median nervule; a somewhat similar fascia extending from second median nervule near end of cell to near inner margin; paler narrow marginal and submarginal fasciæ containing a large, round, dark spot between the second and third median nervules. Posterior wings with the following dark markings:—four basal spots, two large spots beyond cell divided by the upper subcostal nervule, a marginal series of smaller dark spots and paler discal spots, of which the most

\* Lep. Ceyl. vol. i. p. 72 (1881).



prominent are a transverse one at end of cell, and a transverse waved series of rounded ones; all these spots are margined with greyish. Body and legs more or less concolorous with wings.

Female. "Upperside pale glossy blue; cilia white, streaked with brown; forewing with a broad dusky black band along the costa and exterior margin; a patch below the apex, a discocellular spot, and a lower discal spot also black; a short white streak at posterior angle; hindwing broadly dusky black along anterior margin; the exterior margin with a series of black spots bordered with bluish white and an inner dusky line."

Wings beneath marked as in male, but the ground colour paler.

Exp. wings, ♂, 33 millim.; ♀, 36 millim.

HAB.—Malay Peninsula; Penang (Roberts—Moore; Biggs—coll. Dist.).

When I redescribed this species I possessed the male sex only, which is very dissimilar to the female, which was described and figured by Mr. Moore (without mentioning the sex) under the name of a new genus. Now, however, that I possess both sexes the difficulty is solved, and Mr. Moore's proposed genus *Niphanda* will probably accompany my specific name *L. aethiops* into the limbo of synonymic forgetfulness.

The peculiarity of *L. tessellata* is in its Ethiopian appearance, its most closely allied species being found in the West African *L. larydas*, Cram.

Group APHNARIA (*antea*, p. 233).

Genus CATAPÆCILMA (*antea*, p. 234).

## 2. *Catapæcilma*? *bubases*. (Tab. XLIV., fig. 26.)

*Hypochrysops bubases*, Hewitson, Ent. Month. Mag. vol. xii. p. 38 (1875).

"Upper-side: ærulean-blue with all the margins broadly brown. Posterior wing with two slender tails, the outer margin rufous, broadest near the anal angle, where it is bordered above and below with silver."

"Under-side: rufous. Both wings undulated throughout with black, marked by several irregular black spots, and by numerous small silvery-blue spots, some of which form two sub-marginal bands."

Exp. wings, "1 $\frac{5}{8}$  inch."

HAB.—Malay Peninsula; Malacca (Wallace—coll. Hewits.).

I place this species with considerable hesitation in the genus *Catapæcilma*. It is only known to me by the type specimen in the Hewitsonian collection, of which a figure is here given, and I am therefore unable to take liberties with the specimen for the purpose of studying the venuration. Again, the specimen possesses—as described—only two slender tail-like appendages; and if a third has not been mutilated, this character is divergent from *Catapæcilma*.

This species having not hitherto been figured, Mr. de Nicéville has wrongly identified a Sikkim species\* as conspecific with it. The Sikkim species is therefore undescribed and requires a distinctive name.

Genus HORAGA (*to follow* CATAPÆCILMA).

*Horaga*, Moore, Lep. Ceyl. vol. i. p. 98 (1881).

This genus is allied to *Catapæcilma* by the character of the posterior wings, which possess three slender tail-like appendages, and also by the anterior wings having three subcostal nervules only.

\* J. A. S. Beng. vol. liv. p. 118, t. 2, figs. 11 and 1 (1885).

The following are the characters given by Mr. Moore:—

“Forewing short, triangular; costa gently arched, apex acute, exterior margin slightly oblique, even; costal vein recurved; first subcostal branch emitted at half length of the cell, second at one-third, and third close to the end;” . . . . . “cell recurved, broad; discocellulars nearly erect, radial from their middle; middle median branch from near the end of the cell, lower at one third before the end; submedian straight; hindwing short, broad, bluntly oval; exterior margin uneven, furnished with three slender tails; costal vein much curved its entire length; first subcostal branch at one-third before end of the cell; discocellulars oblique, radial from their middle; two upper median branches from end of the cell, lower at one third before the end; submedian slightly curved, internal recurved. Body short, thorax stout; palpi porrect, second joint squamose, slender, extending half beyond the head; third joint cylindrical, one-third length of second; legs short; antennæ short, gradually thickening to a pointed club.”

1. *Horaga halba*, *n. sp.* (Tab. XLIV., fig. 23.)

Wings above violaceous-blue, anterior wings with the costal, apical and outer areas fuscous (the last two very broadly so), and containing a discal whitish spot situate at about end of cell; posterior wings with the costal and outer areas fuscous, a submarginal greyish-white line and the tail-like appendages with their apices greyish. Wings beneath pale ochraceous, both wings crossed by a discal greyish-white fascia, broadest on anterior wings where it commences at a little beyond end of cell, and narrowing on posterior wings below median nervule where it is recurved and continued upwards to abdominal margin as a metallic-greenish fascia inwardly margined with blackish, and followed beneath by a similar fascia; a series of marginal blackish spots near anal angle, inwardly margined with metallic-greenish and black; one at anal angle greyish dusted with black; posterior margin with two blackish lines bordered on each side with greyish. Body mutilated.

Exp. wings, 28 millim.

HAB.—Malay Peninsula; Penang (coll. Dist.).

*H. halba* belongs to a group of species in which great similarity of colour and markings is found. I have, however, carefully compared it with the other described species of the genus, and in the shape of the white spot above and the width and pattern of the white fascia beneath find sufficient characters to separate it.

Genus DRUPADIA (*antea*, p. 236).

1. *Drupadia moorei* (*antea*, p. 236). (Tab. XLIV., fig. 11, *var.*)

A very small female variety of this species is here figured, and, as previously stated (*antea*, p. 237), the species varies very much in size; this is, however, the smallest female specimen examined, measuring in expanse only 20 millim. It is a Malaccan specimen, and is in the collection of Dr. Staudinger.

Genus TAJURIA (*antea*, p. 244).

3. *Tajuria relata* (*antea*, p. 246).

I have since examined a Malaccan male of this species, belonging to the collection of Dr. Staudinger. The wings above are cerulean-blue; anterior wings with the costal margin greyish-brown, the apex broadly dark fuscous, this colour extending to near outer angle;

posterior wings with the costal margin greyish-brown, the outer margin very narrowly fuscous. Wings beneath as above.

Genus *SINTHUSA* (to follow BINDAHARA).

*Sinthusa*, Moore, J. A. S. Beng. vol. liii. p. 33 (1884).

“Male. Wings small: forewing somewhat broad, costa arched at the base, apex pointed, exterior margin slightly oblique and convex, posterior margin convex near the base; subcostal vein five-branched,\* first branch emitted at nearly one half, second at one fourth, and third from near the end of the cell, third bifid near its end: cell extending to half length of the wing; discocellular slender; radial from its middle; lower median at more than one-third and middle median from near end of the cell; submedian straight: hindwing short, broad, costa arched in the middle, exterior margin with a single slender tail from end of lower median; cell broad, triangular, extending half the wing; first subcostal at one-half before end of the cell; discocellular oblique, slender; radial from its middle; lower median at nearly one-half and middle median from near end of the cell; submedian and internal veins recurved. Palpi porrect, second joint long, third joint short, slender, pointed; antennæ with a large thick pointed club.”

I place this genus after *Bindahara*, with which it agrees in having an outer long and an inner short broad and lobular tail-like appendage.

1. *Sinthusa amba*. Tab. XLIV., fig. 12 ♂, 19 ♀.)

*Hypolycaena amba*, Kirby (Hewits.), Ill. Diurn. Lep. Lyc. Suppl. p. 32, t. v, b, f. 44—46 (1878).

Male. Wings above dark shining blue; anterior wings with the costal and outer margins (the last very broadly) dark fuscous or black; posterior wings with the costal and abdominal areas dark fuscous, a small metallic bluish spot on the lobular prolongation to the wing, the apex of the tail-like prolongation white, and the fringe greyish with an inner dark margin. Wings beneath pale greyish-brown; anterior wings with the apex and outer margin tinged with ochraceous, and with two narrow ochraceous fasciæ margined with greyish, the first short at end of cell, the second beyond cell, commencing on third subcostal nervule and crossing wing; posterior wings with two similar fasciæ, the first commencing on lower subcostal nervule, curved, angulated, and terminating near abdominal margin, the second commencing on costal nervule and terminating at upper median nervule, a macular marginal fascia, a large black spot inwardly margined with ochraceous between the two lower median nervules, on each side of which is a bluish and black spot, the lobular prolongation black, a short narrow ochraceous fascia at anal angle, and an ochraceous spot on abdominal margin. Body above dark fuscous, beneath with legs more or less concolorous with wings; abdomen beneath ochraceous.

Female. Wings above dark brownish; posterior wings with a large anal-angular patch of pale greyish with a violaceous tinge, containing some obscure marginal spots; wings beneath as in male.

Exp. wings, ♂ and ♀, 23 millim.

HAB.—Malay Peninsula; Perak (Biggs—coll. Dist.); Malacca (colls. Staud. & Hewits.).

The male specimen here figured is from Malacca, and is contained in the collection of Dr. Staudinger; the female specimen I received from Perak, through the hands of the Rev. L. C. Biggs.

2. *Sinthusa amata*, n. sp. (Tab. XLIV., fig. 20 ♀.)

Female. Wings above dark brown; posterior wings with an anal angular pale greyish patch with a violaceous tinge;—the patch is narrower and extends farther upwards than in *S. amba*, and is separated

\* Four nervules only in my view.

from the posterior margin; tail-like appendage greyish-white with a black central line. Wings beneath pale greyish; anterior wings with the apex and outer margin ochraceous and with two ochraceous fasciæ, the first short at end of cell, the second much dislocated and almost crossing wing beyond cell; posterior wings with a short disco-cellular fasciæ at end of cell, followed by a curved series of seven spots crossing wing and an oblong spot at anal angle,—all these spots dark ochraceous, margined with blackish,—two broken and obscure dark narrow marginal fasciæ, a black spot with some metallic bluish scales between the two lower median nervules, and another spot almost entirely metallic bluish at anal angle, both these spots being inwardly margined with ochraceous. Body and legs more or less concolorous with wings.

Exp. wings, ♀, 23 millim.

HAB.—Malay Peninsula; Penang (Biggs—coll. Dist.).

I have not yet seen the male of *S. amata*, and should have preferred waiting for the same before describing it, but have been compelled to propose a distinctive name, in order that the species might duly appear in this enumeration.

#### Genus NEOCHERITRA (*antea*, p. 252).

##### 2. *Neocheritra gama*, *n. sp.*



FIG. 128.—*Neocheritra gama*.

Female. Wings above ochraceous-brown; anterior wings with the costal area and the apex and outer margin broadly darker brown; posterior wings with the anal-angular area pale greyish-white with bluish margins, and containing two blackish marginal spots separated by the lower median nervule, and a smaller spot at extreme anal angle: a marginal blackish line, the tail-like appendages greyish-white with darker central lines. Wings beneath pale reddish-ochraceous; anterior wings with the area beneath the median nervure and the lower submedian nervule greyish; posterior wings with the anal-angular greyish-white patch as above, but without the bluish margin and inwardly containing a transverse series

of five linear blackish spots, an additional small marginal spot above the second median nervule, the spot between the lower median nervule and the submedian nervule much more obscure than above, and the spot at anal angle larger and brighter and inwardly margined with bluish. Body above greyish-brown, beneath with legs more or less concolorous with wings; tarsi with some blackish annulations.

Exp. wings, ♀, 35 millim.

HAB.—Malay Peninsula; Penang (coll. Staudinger).

A female specimen in the collection of Dr. Staudinger is my only knowledge of this species: the male has still to be discovered.

#### Genus HYPOLYCÆNA (*antea*, p. 255).

##### 4. *Hypolycæna thecloides* (*antea*, p. 257).

I have now received this species, and find it a true *Hypolycæna* as surmised.

Additional HAB.—Malay Peninsula; Sungei Ujong (Durnford—coll. Dist.).

#### Genus IRAOTA (*antea*, p. 258).

##### 2. *Iroata nila*, *n. sp.* (Tab. XLIV., fig. 24 ♀.)

Female. Wings above violaceous-blue; costal and outer margin of anterior wings, and costal, outer and abdominal margins of posterior wings more or less brownish. Anterior wings beneath pale

ochraceous-brown, the area near posterior angle greyish, the area beyond cell more or less castaneous, preceded by a narrow white linear fascia extending from first subcostal to lower median nervule; this fascia is followed by a series of five white spots, and these by a cluster of four apical spots of the same colour; two dark spots are placed beyond the lower two of the five white spots. Posterior wings beneath with about the upper half castaneous, the remaining area more or less ochraceous, shaded with castaneous, and marked with a series of white spots, most of which are shaded or margined with dark bluish; these spots are thus situate:—two subcostal, four (small) subapical, four discal, four (large, and much margined with bluish) on abdominal margin, and a marginal series of lineate spots; a black spot at anal angle and a smaller black spot between the two lower median nervules. Body above more or less concolorous with wings; body beneath with legs greyish, mottled and streaked with brownish.

Exp. wings, ♀, 36 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).

#### Genus NARATHURA (*antea*, p. 259).

With a much larger accumulation of specimens than when I previously enumerated the species of this genus found in the Malay Peninsula, and with more prolonged study and comparison with other species from the surrounding habitats, I am compelled to own that our knowledge of some species is still in the most unsatisfactory condition. Several causes have helped to produce this perplexing confusion, a potent one of which has been the difficulty in properly identifying many of Mr. Hewitson's species, owing to the very indifferent figuring of the under surface of the wings (a difficulty which I have not been altogether unable to overcome with the figures here given), which has led in some instances to the same species being several times redescribed by different authors, and at the same time not figured. Hence it is almost impossible to verify some identifications without a reference to the typical specimens. Another disturbing element is found in that principal guide to specific differentiation, the marking of the under surface of the wings. Here so much variation exists that without breeding it is impossible to say where it either begins or ends, and the shade of blue on the upper surface is often so different as to lead to only two conclusions, *viz.*, either that we are dealing with the most closely allied species, or with seasonal forms of one species.

#### 5. *Narathura farquhari* (*antea*, p. 264).

Female. Resembling the male in hue, but the anterior wings above with a broad costal and outer marginal dark fuscous fascia; this dark colour being broadest at the apex.

I am indebted to Lieut. Goodrich for a specimen of the female sex of this species, which was probably captured at Singapore.\*

\* Attention has already been drawn to the peculiarity of the recurrence of deep blue coloration in different families of the Rhopalocera (*antea*, p. 260). The bright golden-green coloration of *N. farquhari* recalls the remarks of Prof. Haeckel on the prevalence of this hue in the Eastern tropics. "Ransonné had already pointed out how singularly and universally green prevails in the colouring of Ceylon. Not only is the greater portion of this ever-green isle clothed with an unfading tapestry of rich verdure, but the animals of the most widely dissimilar classes, which live in its woods, are conspicuous for their green colouring. This is seen in all the commonest birds and lizards, butterflies and beetles, which are of every shade of brilliant green. In the same way the innumerable inhabitants of the sea, of all classes, are coloured green, such as many fishes and crustacea, worms (*Amphinome*), and sea anemones (*Actinia*); indeed creatures which elsewhere seldom or never appear in green livery wear it here; for instance, several starfish (*Ophiura*), sea-urchins, sea-cucumbers; also some enormous bivalves (*Tridaena*), and Brachiopoda (*Lingula*), and others. An explanation of this phenomenon is to be found in Darwin's principles, particularly in the law of adaptation by selection of similar colouring or sympathetic affinity of colour, as I have elucidated in my 'History of Creation,' vol. i. p. 264. . . . . The green coral banks of Ceylon, with their preponderance of green inhabitants, are as instructive as bearing on this theory as the green land animals are which people the evergreen forests and thickets of the island; but in purity and splendour of colouring, the sea creatures are even more remarkable than the fauna of the forests."—ERNST HÆCKEL ('A Visit to Ceylon,' pp. 185-6).

20. *Narathura buxtoni*. (Tab. XLIV., fig. 18 ♀.)

*Amblypodia Buxtoni*, Hewitson, Ill. Diurn. Lepid. Lyc. Suppl. p. 21, t. 7, f. 68, 69 (1878).

Male. Wings above bright violaceous-blue, the margin somewhat narrowly dark fuscous, containing a greyish line near anal angle of posterior wings, the abdominal area of the same wings greyish-brown. Wings beneath pale brownish, with the following greyish lines or fasciæ:—anterior wings with three pairs of subcostal lines, the last pair somewhat irregularly continued across wing towards lower median nervule, where there is also a small brown spot surrounded with greyish, two broken submarginal lines, three pairs of lines crossing cell, two (small) lines above cell, and three lines beneath cell; posterior wings with some basal spots and crossed by a number of irregular greyish lines, some small submarginal greyish spots, and three black spots shaded with metallic-green at anal angle; tail-like appendage with its apex greyish. Body and legs more or less concolorous with wings.

Female. Resembling the male, but with the wings above having a wider dark margin, especially at the apices.

Exp. wings, ♂ & ♀, 38 to 40 millim.

HAB.—Malay Peninsula; Malacca (coll. Staudinger).—Sumatra (coll. Hewitson).—Borneo; Sandakan (Pryer—coll. Dist.).

The female specimen figured belongs to the collection of Dr. Staudinger, and is the only example I have seen from the Malay Peninsula.

I have here arranged this species after *N. lycenaria*.

Genus PANCHALA (*antea*, p. 272).5. *Panchala trogon* (*antea*, p. 275).

When this species was described the male alone was known, but I have since examined a female specimen from Perak, belonging to Herr Ribbe. Unlike the male, it is violaceous-blue above; the anterior wings with the whole costal area above cell, the apex very broadly and irregularly—almost approaching apex of cell, which has a discocellular spot—and the outer margin also broadly blackish. Posterior wings blackish, with the disk violaceous-blue. Underside as in male.

Exp. wings, ♀, 36 millim.

Genus DEUDORIX (*antea*, p. 277).6. *Deudorix epijarbas*. (Tab. XLI., fig. 5 ♂.)

*Dipsas Epijarbas*, Moore (Horsf. & Moore), Cat. Lep. Mus. E. I. C. vol. i. p. 32, n. 40 (1857).

*Deudorix Epijarbas*, Hewits. Ill. Diurn. Lep. Lyc. t. 7, f. 16—18 (1863); Druce, Proc. Zool. Soc. 1873, p. 353, n. 2; Moore, Proc. Zool. Soc. 1877, p. 589; *ibid.* 1882, p. 250; Lep. Ceyl. vol. i. p. 103, t. 39, f. 4, 4a (1881); Kheil, Rhop. der Insel. Nias, p. 32, n. 114 (1884).

“This is larger than *D. jarbas*, the male having on the upper-side of the fore-wings the dark brown border occupying the whole space between the anterior margin and the median vein (in the latter of which it is nearly black), and then branching off to exterior margin, and ending in a point at the middle of the hind margin. The under-side is of a duller tint, and has two whitish undulating lines crossing the fore- and hind-wings, as also two short lines from the median to subcostal veinlet. The outer black spot is a well-defined lunar-shaped streak of metallic-green. The female is somewhat larger, with rounded wings, and is of a fulvous-brown, but may be distinguished by the similarity of the markings of the under-side.”

Exp. wings, “male  $1\frac{7}{8}$  in., in the female  $1\frac{9}{16}$  in.”

HAB.—Continental India; N.W. Himalaya (Hocking—Moore).—Ceylon (Thwaites—coll. Dist.).—Andaman Islands; Port Blair (Moore).—Malay Peninsula; Perak (Künstl.—coll. Ribbe).—Nias Island (Kheil).—Borneo (Druce).

7. *Deudorix xenophon*. (Tab. XLIV., fig. 1 ♂, 2 ♀.)

*Hesperia Xenophon*, Fabricius, Ent. Syst. iii. 1, p. 272, n. 47 (1793).

*Thecla Xenophon*, Horsf. Cat. Lep. E. I. C. p. 94, n. 27 (1829).

Male. Wings above bright sanguineous-red; anterior wings with the costal margin broadly, the outer margin more narrowly, widened at outer angle,—the inner margin narrowly, and cellular area, excluding apex, blackish; posterior wings with the costal margin, a large basal patch, and an outer marginal line blackish, the neuration more or less of the same colour, abdominal area dark fuscous, the lobular anal angle black, with an ochraceous spot, fringe greyish with the tip fuscous. Wings beneath bronzy; both wings with two contiguous dark discocellular lines, followed by a similar line crossing wings which is outwardly margined with greyish, especially on posterior wings, where it is much angulated towards anal angle, and is there more or less duplex; posterior wings with the outer margin faintly ochraceous, and with three dark marginal spots at anal angle, the outermost black, the remaining two thickly covered with greenish scales, the innermost smallest, lobular anal angle black; posterior margin with a distinct greyish-white line from about discoidal nervule to anal angle. Body above blackish, beneath more or less concolorous with wings; legs blackish, streaked and annulated with greyish-white.

Female. Wings above bronzy-brown, beneath greyish-brown marked as in male, but the wings with an obscure submarginal fascia, and the posterior wings with a greyish lunulate submarginal line.

Exp. wings, ♂, 32 millim.; ♀, 29 millim.

HAB.—Malay Peninsula; Singapore (coll. Mathew).—Sumatra (coll. Dist.).—Java (Horsfield).

The male and female specimens here figured were captured by Mr. Gervase F. Mathew at Singapore, and obligingly lent for figuring in this publication.

———— *marciana* (*antea*, p. 282).

I have still been unable to obtain a specimen of this species, and only know it by the mutilated specimen in the British Museum. I have therefore still left it ungenerically determined, though I was quite wrong in my supposition that it belonged to the genus *Tajuria*, as Mr. Butler informs me it possesses only three subcostal nervules to the anterior wings.

Fam. PAPILIONIDÆ (*antea*, p. 283).—Subfam. PIERINÆ (*antea*, p. 283).

Genus DELIAS (*antea*, p. 289).

8. *Delias pyramus*. (Tab. XLII., fig. 14.)

*Thyca Pyramus*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 347, n. 7 (1867).

*Pieris Thisbe*, Boisd. Sp. Gén. i. p. 449, n. 16 (1836); Gray, Lep. Ins. Nep. p. 8, t. 7, f. 1 (1846).

*Delias Pyramus*, Butl. Proc. Zool. Soc. 1872, p. 29, n. 3.

Male. Allied to *D. parthenope*, Wall., but considerably larger; posterior wings with the basal carmine-red patch larger and not or very obsoletely followed by bluish, the yellow space much smaller and restricted to the lower median nervule. Wings beneath very similar to those of *D. parthenope*.

Exp. wings, ♂, 84 millim.

HAB.—Continental India; Nepaul (Gray); Darjeeling (coll. Dist.).—Malay Peninsula; Perak (3700 feet), (Egerton—coll. Dist.).

This is one of the many captures of Mr. W. Egerton, and was obtained on the summit of “Low’s Hill at Perak.”

SEPT. 30, 1886.

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4. *Delias ithiela* (*antea*, p. 292).

I inserted both the description and figure of this species on the authority of Mr. Butler, who in 1869 described the species as from Penang; and in 1871 figured it in another publication, still giving the same habitat. Mr. Butler now writes: \*—"Originally described from Penang, and on that account included by Mr. Distant in his 'Rhopalocera Malayana'; this locality, however, was an error arising out of the fact that the type was labelled thus—'P.', which with Wallace's specimens stands for 'Penang,' but with specimens received from the East India Company (as Mr. Moore pointed out some two or three years since on a ticket which is attached to this very species) it stands for 'Darjeeling, Pearson.' Had Mr. Distant examined my type, which by his own admission he did not do, he would have avoided the repetition of this error."

This argument would logically imply two axioms, *viz.* (1) Mr. Butler's recorded localities cannot be taken without an examination and verification of the labels attached to his "types"; and (2) if "types" are not contained in this country, neither names nor localities should be used; a "*reductio ad absurdum.*" Although Mr. Butler now definitely records his species from the somewhat vague locality "Near Assam," I have thought it best to still let it appear in this enumeration, as his "P." may yet prove to be Penang and not "Darjeeling, Pearson."

9. *Delias descombesi*. (Tab. XLII., fig. 16 ♂.)

*Pieris Descombesi*, Boisduval, Sp. Gén. i. p. 465, n. 39 (1836).

*Thyca Descombesi*, Wall. Trans. Ent. Soc. ser. 3, vol. iv. p. 350, n. 16 (1867).

*Delias Descombesi*, Butl. Proc. Zool. Soc. 1872, p. 34, n. 44.

Male. Wings above greyish-white; anterior wings with the costal and outer margins—broadest at apex—blackish; posterior wings with the posterior margin blackish. Anterior wings beneath blackish, a greyish spot at end of cell, three elongate subapical spots followed by smaller marginal spots of the same colour, the median nervure and the two lower median nervules more or less powdered with greyish; posterior wings beneath bright orange-yellow, the costal and outer margin blackish, containing an oblong vermilion patch at base and a marginal series of yellow spots. Body above blackish, beneath more or less greyish, the sternum shaded with yellow.

Female. Anterior wings above blackish, with the greyish spots more or less visible above; posterior wings with the blackish marginal border very broad. Wings above as in male.

Exp. wings, ♂ & ♀, 70 to 72 millim.

HAB.—Continental India; Silhet, Nepaul, Darjeeling (Brit. Mus.).—Burma; Moulmein (Brit. Mus.).—Malay Peninsula; Penang (Brit. Mus.); Province Wellesley (Birch—coll. Dist.).—Cochin China (Wallace).

Genus TERIAS (*antea*, p. 302).8. *Terias lacteola*, *n. sp.*

FIG. 129.—*Terias lacteola*.

Wings above milky-white; anterior wings with the costal margin narrowly and the apex, outer margin, and inner margin—for a little more than one-fourth of its length—blackish; this black apex and outer margin is arranged somewhat as in *T. hecabe*, but broader; posterior wings with a narrow blackish outer margin. Wings beneath creamy-white, the black markings reflected indistinctly beneath; anterior wings with an irregularly

\* Ann. & Mag. Nat. Hist. ser. 5, vol. xvi. p. 339 (1885).



rounded spot at end of cell, and posterior wings with a few discal spots composed of pale brownish scales. Body mutilated.

Exp. wings, 41 millim.

HAB.—Malay Peninsula; Singapore (coll. Godfery).

A single specimen of this distinctly coloured species is contained in the collection of Capt. Godfery, and is the only *white* Teriad I have seen from the Malay Peninsula. A somewhat similar species is represented by an Amboinese specimen in the British Museum.

Genus APPIAS (*antea*, p. 310).

1. *Appias nero* (*antea*, p. 311).

Mr. Forbes has published the following observations respecting this species as found in Sumatra:—"In the open paths and sunny roads I netted scarlet *Pierida* (*Appias nero*), often flying in flocks of over a score, exactly matching in colour the fallen leaves, which it was amusing to observe how often they mistook for one of their own fellows at rest, and to watch the futile attentions of an amorous male towards such a leaf moving slightly in the wind."\*

9. *Appias lagela*. (Tab. XLI., fig. 11.)

*Catophaga Lagela*, Moore, Proc. Zool. Soc. 1878, p. 838, t. 52, f. 4.

"Allied to *C. talage*, † Doubleday, D. Lep. pl. 6, f. 3."

"*Male and Female*. Smaller. Upperside differing on the fore wing in the black apical border terminating in both sexes before reaching the posterior angle, and the medial portion partly excavated outside the lower end of the cell, and thence extending across the end to its base; hind wing with a broad marginal continuous band (as in *C. pandione*, Hübn.). Underside—fore wing with the black band terminating as above; the apex and hind wing greyish-yellow, speckled with purple in male, and brownish-grey with darker speckles in female, the speckles numerous across the disk, and forming zigzag fasciæ."

Exp. wings, "2½ inches."

HAB.—Tenasserim; Moolai (Limborg—Moore).—Malay Peninsula; Perak (Künstl.—coll. Ribbe).

This species is here arranged after *A. leis*.

Subfam. PAPILIONINÆ (*antea*, p. 321).

Genus PAPILIO (*antea*, p. 324).—Subgen. ORNITHOPTERA (*antea*, p. 325).

4. *Ornithoptera brookeana* (*antea*, p. 330.)

To the other collected facts respecting the characteristics of this butterfly may be added the curious observation made by Mr. Forbes in Sumatra, in the neighbourhood of the hot springs, that its "favourite resort was the stones that cropped out above the hot water, and which were of a temperature but little below 130° F." †

\* 'Nat. Wanderings in Eastern Archipelago,' p. 130.

† A species found in Continental India.

‡ 'Nat. Wanderings in Eastern Archipelago,' p. 227.

At the hot springs of Soorujkoond Dr. Hooker found that a water beetle abounded in water at 112° ('Himalayan Journals,' vol. i. p. 25). Water beetles, however, seem to have extraordinary vitality, as Dr. Auerbach, writing to the 'Chemiker-Zeitung,' mentions as a curious fact that during an entire summer he observed water beetles—probably *Gyrinus natator*—living in tanks of a saturated solution of Glaubers salts. When alarmed the beetles took shelter under the crystals, just as they do in ordinary circumstances under water plants, &c. ('Psyche,' vol. iii. p. 143).

Subgen. PAPILIO (*antea*, p. 332).—MEMNON Group (*antea*, p. 339).

29. *Papilio sycorax*. (Tab. XLII., fig. 10.)

*Papilio Sycorax*, Smith, Ent. Month. Mag. vol. xxi. p. 247 (1885).

*Papilio Egertoni*, Dist. Ann. & Mag. Nat. Hist. ser. 5, vol. xvii. p. 251 (1886).

Anterior wings above blackish, the nervures and nervules margined with dull obscure greyish; posterior wings above bluish-grey, the cell and the area from costal margin to lower subcostal nervule almost totally dark bluish-black and with a double series of spots of the same colour placed between the nervules, the uppermost and discal series smallest, consisting of four spots, of which the largest is subquadrate and placed between the lower subcostal and the discoidal nervules; the outer series marginal and larger than the discal spots; abdominal area dark bluish-grey and with two small spots of the same colour placed beneath cell and divided by the second median nervule; fringe very narrowly ochraceous. Anterior wings beneath as above, but with the greyish markings paler and brighter and with oblique greyish streaks in cell; posterior wings paler and brighter than above; the blackish basal area continued inwardly to submedian nervure. Body above with the head and anterior portion of pronotum pale buff-yellow, remainder of pronotum black; abdomen ochraceous, with a greenish tinge, its base black and with two lateral rows of black spots on each side; body beneath with the head, thorax, and legs black, the abdomen beneath darker ochraceous than above; palpi pale buff-yellow.

Exp. wings, 150 millim.

HAB.—Malay Peninsula; Perak (Egerton).—Sumatra (Bock—coll. Grose Smith).

Mr. Egerton had more than once written to me concerning this *then* undescribed *Papilio*, which he had succeeded in discovering, but some time elapsed before it reached my hands, and I had not noticed that in the meantime it had been received from Sumatra, and was described by Mr. H. Grose Smith, whose name of course claims priority.

HELENUS Group (*antea*, p. 343).

11. *Papilio nephelus* var. *saturnus* (*antea*, p. 345).

*Papilio albolineatus*, Forbes, Nat. Wand. East. Archip. p. 275 (1885); Waterh. Aid. Ident. Ins. vol. ii. t. 166, f. 1 (1886).

Mr. Forbes has redescribed the female sex of this species, having also apparently greatly relied upon the additional pale spot at the apex of the cell of the anterior wings. This, however, is not a constant character, as my Malay specimens sufficiently prove. Further testimony, if needed, is to be found in the fact that this female form of the species is found in all its habitats.

MACAREUS Group (*antea*, p. 355).

30. *Papilio megarus*. (Tab. XLII., fig. 9.)

*Papilio Megarus*, Westwood, Arc. Ent. ii. t. 72, f. 2 (1845); Gray, Cat. Lep. Papil. p. 71, n. 326 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 90, n. 183 (1857); Moore, Proc. Zool. Soc. 1878, p. 840.

Wings above dark fuscous, with the following spots and markings of pale greyish-green:—anterior wings with a small spot at base of cell, followed by three oblique cellular fasciæ and two spots at end of cell, an oblique spot at base of wings, two spots beneath base of cell, an inner marginal streak, two contiguous fasciæ between lower median nervule and submedian nervure, a broad streak between the two

lower median nervules, two discal series, the innermost consisting of five, the outermost of six spots, and a marginal series of spots, the lowermost duplex; posterior wings with a costal and abdominal marginal streak, a streak in and a streak above cell, a small spot in and near end of cell, two short streaks beneath cell divided by the second median nervule, a double series of discal spots and a marginal series of submarginate spots. Body above fuscous, margined on each side with greyish, beneath with the thorax spotted with greyish, and with a central abdominal greyish fascia.

Exp. wings, 75 millim.

HAB.—Continental India; Silhet (Brit. Mus.).—Tenasserim; Hongduran source (Limborg—Moore).—Malay Peninsula; Perak (Goodrich—coll. Dist.).

This species possesses one of those remarkable resemblances to a Danaid which is best expressed by the term—used in its biological sense—“mimicry,” and it no doubt possesses protection from its enemies by the close resemblance to an inedible species.\*

### 31. *Papilio agetes*. (Tab. XLII., fig. 8.)

*Papilio Agetes*, Westwood, Arc. Ent. ii. t. 55, f. 1, 2 (1843); Gray, Cat. Lep. Papil. p. 31, n. 145 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 116, n. 233 (1857); Oberth. Études d'Ent. Quatr. Livr. p. 67, n. 185 (1879).

Wings above pale stramineous, with a greenish tinge; anterior wings with the following black markings:—three transverse fasciæ crossing cell of which the basal is narrowest, a triangular discocellular spot at end of cell, an oblique fascia commencing on costal margin a little beyond end of cell and terminating on outer margin a little above outer angle, the outer margin somewhat broadly black; posterior wings with the outer margin blackish, containing some linear greenish-grey spots and with an oblique red fascia more or less margined with blackish at anal angle; caudate appendages blackish with a central obscure greyish line, and their apices greyish-white. Anterior wings beneath as above, but the central cellular fascia extending a short distance beneath median nervure; posterior wings as above, but with two black fasciæ crossing wing, the first commencing near base of costal margin and terminating near anal angle, the second crossing wing a little before end of cell, spotted with red above cell, and terminating jointly with the other fascia near anal angle, beneath the cell are two minute red spots placed a little beyond the outer fascia. Head and anterior portion of pronotum dark ochraceous, with a central and a lateral fascia on each side black, remainder of pronotum greenish with a central black fascia; thorax beneath greenish-grey, with a lateral black fascia on each side; abdomen pale stramineous, with a blackish dorsal fascia.

Exp. wings, 78 millim.

HAB.—Continental India; Silhet (coll. Oberth.); Darjeeling (Horsf. & Moore).—Malay Peninsula; Perak (Egerton—coll. Dist.).

\* The search for evidences of evolution is only another form of the energy formerly displayed in the study of what were called “marks of design.” The teleologist of that time is the evolutionist of to-day. The processes are the same, the results are simply called by another name. As Ernst Krause has truly remarked, “In the numerous works of the last century which treat of physico-theology, and especially in those on insecto-theology, in which the existence of a purpose in all the arrangements of Nature was discussed in all senses, there are probably numerous examples of phenomena pertaining to ‘mimicry.’ Thus Rösel von Rosenhof, in his ‘Insekten-Belustigungen’ (Nürnberg, 1746), describes the resemblance which the caterpillars of geometric moths, and also certain moths when in repose, present to dry twigs, and thus conceal themselves, but this group of biological phenomena seems to have been first regarded from a more general point of view by Dr. Darwin” (‘Life of Erasmus Darwin,’ p. 163, note).

It seems singular that with all the current literature on mimicry, which is altogether based on the disguises which different living organisms have acquired to protect themselves from ever-present enemies,—

“The grub eats up the pine,

The finch the grub, the hawk the silly finch,”—

no reflections are ever made on the difference in view which this has effected in the philosophical conclusions as to what was wont to be called the “moral order of the universe.”

32. *Papilio anticrates*, var. (Tab. XLII., fig. 7.)

*Papilio Anticrates*, Doubleday, Ann. Nat. Hist. xviii. p. 371 (1846); Gray, Cat. Lep. Papil. p. 29, n. 140, t. 3, f. 3 (1852); Horsf. & Moore, Cat. Lep. Mus. E. I. C. vol. i. p. 115, n. 231 (1857).

Wings above pale greenish-white; anterior wings with the costa and a broad outer margin black, the last divided by a narrow greenish-white line which is broken by the nervules, two black fasciæ crossing wing near base, followed by three shorter fasciæ of which the innermost alone extends slightly beneath the median nervure; posterior wings with two longitudinal black basal fasciæ (in Sikkim and typical specimens the outer of these fasciæ is broken and subobsolete), a broad blackish outer marginal fascia—becoming plumbageous at anal angle—divided by a series of greenish-white lunules, above the anal angle are two pale ochraceous margined spots, tail-like appendages black, their margins and apex more or less greyish-white. Anterior wings beneath as above but much paler, posterior wings beneath much paler than above, the outer basal longitudinal fascia outwardly margined with a series of black and red spots which are deflected and continued inwardly to a little above anal angle, outer margin paler than above, but with its outer portion exhibiting a series of black sublunulate spots, a black spot—both above and below—on abdominal margin a little above anal angle. Body above blackish, pronotum with a greyish fascia on each side, the abdomen annulated with the same colour; body beneath greyish-ochraceous; legs greyish, more or less suffused with blackish.

Exp. wings, 60 to 70 millim.

HAB.—Continental India; Silhet (Gray); Sikkim (de Nic.—coll. Dist.); Darjeeling (Horsf. & Moore).—Malay Peninsula; Perak (Egerton—coll. Dist.).

Fam. HESPERIIDÆ\* (*antea*, p. 366).—Group ERIONOTARIA (*antea*, p. 392).

Genus PLASTINGIA (*antea*, p. 396).

2. *Plastingia hieroglyphica*. (Tab. XLIV., fig. 25.)

*Plastingia Hieroglyphica*, Butler, Trans. Ent. Soc. 1870, p. 511, n. 2; Lep. Ex. p. 171, t. 59, f. 12 (1874).

“Wings above black; front wings with a spot at the base, two at the middle of the wing, and four across the disc, the uppermost oblique and divided into four parts by the subcostal and discoidal branches, the third bifid, slanting towards the lower end of the first, the second small, between the first and third, the fourth near the anal angle, divided by the submedian nervure; hind wings with a large basal spot, a streak and two small spots on the inner margin, two spots at the apex, a large triangular spot on the disc, and another at the anal angle, all deep orange; body brown, spotted with orange; abdomen with orange rings.† Wings below, almost as above, but paler; body greyish, with mesial yellow stripe.”

Exp. wings, “1 inch, 6 lines.”

HAB.—Malay Peninsula; Perak (coll. Dist.).—Borneo; Sarawak (Lowe—coll. Godm. & Salv.).

\* Mr. Doherty states that “a kind of hermaphroditism seems to occur in the *Hesperiidæ*. From the body of (apparent) males of *Suastus celtola* and of *Coladenia dan*, both having perfect prehensors of the form characteristic of their respective species, I obtained one or two well-developed eggs exactly similar to those taken from the females of the same species. Also from a male of *Suastus toona* (the egg of that species being, except for this, unknown to me) I obtained a single immature blood-red egg. I have not obtained this in any of the higher groups of butterflies” (Journ. Asiat. Soc. Beng. vol. lv. p. 113 (1886)).

† The body of the specimen figured was unfortunately mutilated, and therefore had to be sketched under the artist's imagination, without showing these black markings.

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## ERRATA.

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- Page 7, *Hestia linteata*. Tab. II., fig. 1 should read Tab. I., fig. 1.  
.. 45, fifth line from bottom of page, for "anennæ" read antennæ.  
.. 69, for *Zeuzidia* read *Zeuzidia*.  
.. 75, for Long. ♂ 70 to 75 mill. read "Exp. wings," &c.  
.. 78, for 3. *Thaumantis noureddin* read 2. *Thaumantis noureddin*.  
.. 347, for *Papilio Polytes*. (Tab. XXIII., figs. 7 ♂ ; 8, 9, 10 ♀ ), read XXXIII., &c.  
.. 371, for *Lotongus calathus*. (Tab. XXIV., fig. 14), read XXXIV., &c.  
.. 377, for *Yea mythecca* read *Zea mythecca*.  
.. 425, for *Zeuzidea* read *Zeuzidia*.  
.. 444, for *Neptis vikasa* read *Neptis vikasi*.  
.. 462, for *Iraota nila* read *Iraota nila*.



RHOPALOCERA MALAYANA.



PLATES.

# DESCRIPTION OF PLATES.

TAB. I.

- FIG.  
1. *Hestia linteata*  
2. „ *lynceus*  
3, 4. *Ideopsis daos*  
5. *Danais agleoides*  
6. „ *melaneus*  
7. „ *aspasia*  
    *var. crocea*  
8. *Radena vulgaris*  
9. *Danais septentrionis*  
10. „ *chrysippus*

TAB. II.

1. *Danais melanippus*  
    *var. hegesippus*  
2, 3. „ *genutia*  
4. *Euplœa bremeri*  
5. „ *chloe*  
6. „ *castelnaui*  
7. „ *malayica*  
8, 9. „ *midamus*  
10. „ *ledereri*

TAB. III.

- 1, 2. *Euplœa mulciber*  
3. „ *harrisi*  
4, 5. „ *ménétriési*  
6, 7. „ *vestigiata*  
8. „ *godarti*  
9, 10. „ *pinwilli*

TAB. IV.

1. *Euplœa dejeani*  
2. „ *chloe*  
3. „ *margarita*  
4, 5. „ *diocletianus*  
6. *Ypthima newboldi*  
7. *Mycalesis mineus, var.*  
8. „ *medus*  
9. *Melanitis ismene*  
10. „ *leda*  
11, 12. „ *ismene*  
13, 14. *Mycalesis mineus*

TAB. V.

1. *Mycalesis fusca*  
2. „ *janardana*  
3. *Erites angularis*  
4. *Mycalesis orseis*  
5, 6. *Lœthe europa*  
7. *Xanthotania busiris*  
8. *Euplœa crassa*  
9. „ *distanti*  
10, 11. *Discophora celinde*

TAB. VI.

1. *Elymnias nigrescens*  
2, 3. „ *discrepans*  
4, 5. „ *lutescens*

FIG.

- 6, 7. *Amathusia phidippus*  
8. *Ypthima pandocus*  
    *var. corticaria.*  
9. „ *methora*  
10. *Elymnias casiphone*  
11. „ *penanga*

TAB. VII.

- 1, 2. *Zeuxidia amethystus*  
3. *Thaumantis noureddin*  
4. *Mycalesis maianeas*  
5. *Ypthima hübbneri*  
6. *Elymnias penanga*  
7. *Mycalesis blasius*  
8, 9. *Discophora tullia, var.*

TAB. VIII.

1. *Clerome gracilis*  
2. „ *faunula*  
3. *Thaumantis pseudalaris*  
4. *Cupha erymanthis*  
5. *Cethosia logani*  
6, 7, 8. „ *hypsinia*  
9. „ *methypsea*

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1. *Elymnias nigrescens*  
2. „ *lais*  
3. „ *saüeri*  
4. *Atella phalanta*  
5. *Precis iphita*  
6. *Doleschallia pratipa*  
7. *Thaumantis noureddin*  
8, 9. „ *lucipor*

TAB. X.

- 1, 2. *Cynthia deione*  
3, 4. *Cirrochroa malaya*  
5. *Cynthia cantori*  
6. *Terinos teuthras*  
7. „ *robertsia*  
8. *Atella sinha*  
9. *Cirrochroa orissa*  
10. „ *rotundata*

TAB. XI.

- 1, 2. *Junonia asterie*  
3, 4. „ *wallacci*  
5. „ *lemonia*  
6. *Ergolis ariadne*  
7. *Parthenos gambrisius*  
    *var. lilacinus*  
8. *Doleschallia pratipa*  
9. *Precis iphita*  
10. „ *ida*  
11, 12. *Junonia atlites*

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- FIG.  
1, 2. *Rhinopalpa fulva*  
3. *Cyrestis nivea*  
    *var. nivalis*  
4. *Chersonesia rahria*  
5, 6. *Eulacura osteria*  
7, 8. *Symphra-dra dirtea*  
9. *Hypolimnias misippus*  
10. „ *bolina*  
11. „ *misippus*  
12. „ *bolina*  
13. *Pandita sinope*

TAB. XIII.

1. *Charaxes harpax*  
2. „ *schreiberi*  
3. „ *moori*  
4. „ *jalyus*  
5. *Cyrestis earli*  
6, 7. *Euripus euplœoides*  
8. *Charaxes athamas*  
    *var. samatha*  
9. *Prothoe caledonia*

TAB. XIV.

- 1, 2. *Euthalia garuda*  
3. „ *asoka*  
4. „ *lubentina*  
5. „ *anosia*  
6. „ *macnairi*  
7. „ *laverna*  
8. „ *jama*  
9. „ *decorata*  
10. „ *macnairi*  
11. „ *stoliczkana*  
12. „ *maclayi*  
13. *Tanaëcia pulasara*

TAB. XV.

1. *Charaxes delphis*  
2. „ *hebe*  
3. *Euthalia puseda*  
4. „ *jama*  
5. „ *asoka*  
6. *Ergolis merione*  
7. *Tanaëcia aruna*  
8. „ *supercilia*  
9. „ *violaria*  
10. *Eurytela castelnani*  
11. *Hypolimnias misippus*  
12. „ *bolina*

TAB. XVI.

1. *Athyma larymna, var.*  
2. „ *perius*  
3. „ *kresna*  
4. „ *subrata*  
5. „ *amhara, var.*  
6, 7. „ *nefte*  
    *var. nivifera*

FIG.

8. *Athyma abiasa*  
    *var. clerica*  
9, 10. „ *idita*  
11. „ *pravara*  
12. „ *urvasi*  
13. *Neptis vikasi*  
14. „ *eurynome*  
    *var. manaja*  
15. „ *duryodana, var.*

TAB. XVII.

1. *Limenitis procris*  
2. *Neptis peraka*  
3. „ *tiga*  
    *var. dorelia*  
4. „ *tiga*  
5. „ *dindinga*  
6. *Rhinopalpa? eudoxia*  
7. *Cirrochroa clagia*  
8, 9. *Hypolimnias incommoda*  
10, 11. *Lebadea martha*  
12. *Neptis ophiana*  
13. „ *hordonia*  
14. „ *leuconata*

TAB. XVIII.

1. *Neptis nata*  
2. „ *gononata*  
3, 4. *Zemeros emesoides*  
5. *Abisara savitri*  
6. *Tanaëcia flora*  
7. *Euthalia coeytina*  
8. „ *puseda*  
9. *Tanaëcia pulasara, var.*  
10, 11. *Abisara kausambi*  
12. *Zemeros albipunctata*  
13. *Abisara haquinus*  
14. „ *tanita*

TAB. XIX.

- 1, 2. *Cirrochroa bajadeta*  
3. *Melanitis abdulla*  
4. *Euthalia derma*  
5. „ *ramada*  
6. *Tanaëcia pulasara*  
7. *Ragadia crisis*  
8. *Cœlites epiminthia*  
9. *Cirrochroa satellita*  
10, 11. *Euthalia adonia, var.*

TAB. XX.

1. *Polyommatus bæticus*  
2. *Gerydus symethus*  
3. *Nacaduba macrophalma*  
4. *Castalius elna*  
5, 6. *Hypolycœna erylus*  
7. *Paragerydus horsfieldi*  
8. *Polyommatus bæticus*  
9. *Zizera lysizone*

DESCRIPTION OF PLATES.

- FIG.  
10. Cheritra freja  
11. Lampides kankena  
12. Poritia sumatræ  
    *var. ?*  
13, 14. Nacaduba aluta  
15. Neocheritra amrita  
16, 17. Nacaduba beroë  
18. Lampides kankena  
19. Hypolycaena tharis  
20, 21. Drupadia moorei  
22. Nacaduba almora  
23. Hypolycaena etolus  
24. Nacaduba viola  
25. Bindahara phocides  
26. Deudorix jarbas  
27, 28. Lampides elpis  
    *var. pseudelpis*  
29. Biduanda lapithis  
30. Drupadia moorei

TAB. XXI.

1. Narathura kurzi
2. Catochrysops cnejus
3. Lycænesthes lycanina
- 4, 5. Narathura centaurus
6. Cyaniris haraldus
7. Nacaduba sp. ?
8. Catochrysops strabo
- 9, 10. Narathura amphimuta
11. Tajuria mantra
12. " relata
13. Semanga superba
14. Catochrysops strabo
15. Jacoona anasuja
16. Jamides bochus, *var.*
17. Catochrysops pandava
18. Lampides ælianus
19. Jamides bochus, *var.*
20. Narathura anniella
21. Poritia phraatica
22. Cyaniris lambi
23. Amblypodia narada
24. Lampides sp. ?
- 25, 26. " elpis
27. Dacalana vidura
28. Purlisa gigantea
29. Narathura agnis
30. " ameria

TAB. XXII.

1. Sithon nedymond, *var.*
- 2, 3. Poritia sumatræ
4. Tajuria travana
- 5, 6. Poritia pleurata
7. " potina
8. " phalena
- 9, 10. " pheretia
11. Paragerydus nivalis
12. Gerydus biggsii
13. Neomyrina hiemalis
14. Gerydus symethus
15. Neopithecopus horsfieldi
16. Poritia pediada
17. Catapæcilma elegans
18. Liphvra brassolis
19. Lampides ælianus, *var.*
20. Castalius rosimon
21. Logania malayica
22. Zizera karsandra
23. Iraota boswelliana
24. Castalius roxus
25. " ethion
26. Curetis felderi
27. " sperthis
28. " malayica

TAB. XXIII.

- FIG.  
1, 2. Narathura adatha  
3. " farquhari  
4. " anthelus  
5, 6. " atosia  
7. Deudorix domitia  
8, 9. Spindasis syama  
10. Narathura maxwelli  
11. " antimuta  
12. Neocheritra amrita  
13. Rapala amisena  
14. Panchala diardi  
15. Sithon chitra  
16. Gen. ? mareiana  
17. Narathura aroa  
18. " metamuta, *var. ?*  
19. " metamuta  
20. Tajuria longinus  
21. Deudorix sequeira  
22. " utimutis

TAB. XXIV.

- 1, 2. Catopsilia scylla
3. Curetis felderi
4. Delias parthenope
- 5, 6. " dione
7. Loxura atymnus
8. Poritia phraatica
- 9, 10. Appias nero
11. Stiboges nymphidia.
12. Curetis æsopus
- 13, 14. Delias hyparete  
    *var. metarete*
15. Deudorix jarbas
16. Prioneris clemanthe

TAB. XXV.

- 1, 2. Catopsilia chryseis
3. Terias sari
- 4, 5. Appias hippo
6. " leis, *var.*
7. " "
8. Terias tilaha
9. Appias leptis, *var. plana*
10. " leis, *var.*
- 11, 12. Catopsilia erocale
13. Terias harina
14. " senna
- 15, 16. Catopsilia catilla

TAB. XXVI.

- 1, 2. Saletara nathalia
3. Terias sari, *var.*
4. Ixia birdi
- 5, 6. Udaiana cynis
7. Terias sari, *var.*
8. Leptosia xiphia
9. Hebomoia glaucippe
10. Terias pumularis, *var.*
11. " hecabe, *var.*
12. Nepheronia hippia  
    *var. gæa*
13. Terias senna
14. Nepheronia lutescens
15. Terias hecabe, *var.*
16. Nepheronia hippia,  
    *var. gæa*
17. Terias vallivolans
18. Dercas gobrias
19. Terias hecabe
20. Catopsilia chryscis, *var.*

TAB. XXVII.

1. Ornithoptera ruficollis
2. " hephaestus, *var.*
- 3, 4. " "

- FIG.  
5. Papilio onpape  
6. " butleri

TAB. XXVII. A.

1. Ornithoptera ruficollis,  
    *var.*
- 2, 3. Papilio leucothoë
4. Ornithoptera brookeana
5. " rhadamanthus
6. Papilio butleri

TAB. XXVII. B.

1. Ornithoptera brookeana
2. Papilio clytia
3. " demolion
4. " delessertii
5. " cannus  
    *var. ægialus*
6. " erithonius  
    *var. malayanus*
7. " phoenix

TAB. XXVIII.

1. Papilio esperi
2. " mestor
- 3, 4, 5. " achates
6. " esperi
7. " mestor

TAB. XXIX.

1. Papilio agenor
2. " prexaspes
3. " helenus
- 4, 5. " cilix

TAB. XXX.

- 1, 2. Papilio iswara
- 3, 4, 5. " nephelus  
    *var. saturnus*

TAB. XXXI.

- 1, 2. Papilio erebus
- 3, 4. " varuna
5. " antiphates  
    *var. pompilius*
- 6, 7. " aristolochiæ  
    *var. diphilus*

TAB. XXXII.

1. Papilio evemon
2. " bathycles
3. Leptocircus meges
4. Papilio brama
5. " arycles
6. " sarpedon
7. " agamemnon

TAB. XXXIII.

1. Appias amalia
2. " andersoui
3. " cardena
4. Papilio doubledayi
- 5, 6. " neptunus
- 7, 8, 9, 10. " polytes

TAB. XXXIV.

1. Tagiades ravi
2. " gana
3. Udaspes folus
4. Hyarotis adrastus
5. Tagiades lavata
6. " atticus  
    *var. calligana*

- FIG.  
7. Plesioneura alysos  
8. Kerana diocles  
9. Baoris chaya  
10. " moolata  
11. Unkana batara  
12. Baoris narooa  
13. Gangara thyrsis  
14. Lotongus calathus  
15. Hidari irava  
16. Abaratha sura  
17. Erionota thrax  
18. Abaratha pygela  
19. Kerana aurivittata  
    *var. cameroni*

20. Tagiades trichoneura *var.*
21. Astictopterus salsala
22. Choaspes harisa
23. Telicota augias
24. " mæsoides
25. Unkana elia
26. Choaspes crawfurdi
27. " chuza
28. Astictopterus xanites
29. Kerana gemmifer
30. Unkana attina

TAB. XXXV.

1. Lotongus maculatus
2. Choaspes? malayanus
3. Hasora badra
4. " vitta
5. Paduka glandulosa
6. Pirdana hyela
7. Zea nythea
8. Matapa aria
9. Pithauria murdava
10. Baoris mathias
11. " unicolor
12. Telicota bambuse
13. " goloides
- 14, 15. " maro
16. " nigrolimbata
17. Satarupa affinis  
    *var. cognata*

18. Casyapa phaneus
19. Isma obscura
20. " bononia
21. Tagiades dealbata
22. Baoris? insignis
23. Isma? homolea
24. Hidari sybiritia
25. " staudingeri
26. Plastingia callineura
27. Coladema dan
28. Plesioneura asmara
29. " pinwilli
30. Astictopterus sindu
31. Kerana armata
32. Plesioneura? anthea

TAB. XXXVI.

1. Charaxes baya
2. " distanti
3. Thaumantis odana
- 4, 5. Euthalia lepidea, *var.*
6. Abisara neophon
7. Mycalesis anaxias
8. Lethe minerva
- 9, 10. Euthalia xiphones
11. Neptis anjana, *var.*

TAB. XXXVII.

1. Zeuxidia aurelius
2. Kallima buxtoni, *var.*
3. Neorina lowii, *var.*
4. Euthalia bellata
5. Mycalesis mnasicles

DESCRIPTION OF PLATES.

FIG.

6. *Charaxes bornöensis*, var.
7. *Euthalia parta*

TAB. XXXVIII.

1. *Euthalia derma*
2. *Melanitis zitenius*
3. *Cethosia biblis*
4. *Prothoe uniformis*
5. *Zeuxidea amethystus*
6. " *doubledaii*
7. *Amathusia dilucida*

TAB. XXXIX.

1. *Euploea marsdeni*
2. *Melanitis suyudana*
3. *Hestia leuconoe*
4. *Radana juvenata*
5. *Elymnias godferyi*
6. *Ergolis isaus*
7. *Tenaris birchi*
8. *Mycalesis anapita*
9. *Lethe mekara*

TAB. XL.

1. *Vanessa perakana*
- 2, 3. *Abisara telesia*

FIG.

4. *Mycalesis nautilus*
5. *Clerome arcesilaus*
6. *Chersonesia peraka*
7. *Symphodra pardalis*
8. *Charaxes durnfordi*
9. *Tanaëcia nicévillei*
- 10, 11. *Abisara damajanti*
12. *Paduca fasciata*
13. *Danais chrysippus*  
var. *alcippoides*

TAB. XLI.

- 1, 2, 3, 4. *Hypolimnas anomala*
5. *Deudorix epijarbas*
- 6, 7. *Curetis insularis*
8. *Poritia pharyge*
9. *Elymnias künstleri*
10. *Cyrestis perianther*
11. *Appias lagela*
12. *Cirrochroa rotundata*
13. *Cyrestis coeles*
14. *Neptis miah*, var.
15. *Danais tytia*
16. *Mycalesis ustulata*

TAB. XLII.

1. *Leptocircus curius*
2. *Libythea myrrha*

FIG.

3. *Simiskina fulgens*
- 4, 5. *Symbrenthia hyppoclus*
6. " *hypatia*
7. *Papilio anticrates*, var.
8. " *agetes*
9. " *megarus*
10. " *sycorax*
11. *Danais abigar*
12. *Nacaduba kerriana*
13. *Lycanesthes tessellata*
14. *Delias pyramus*
15. *Deramas livens*
16. *Delias descombesi*

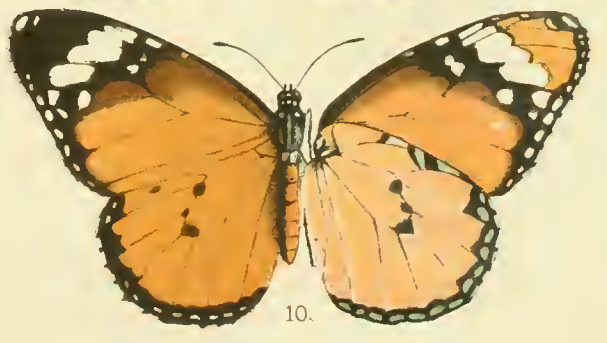
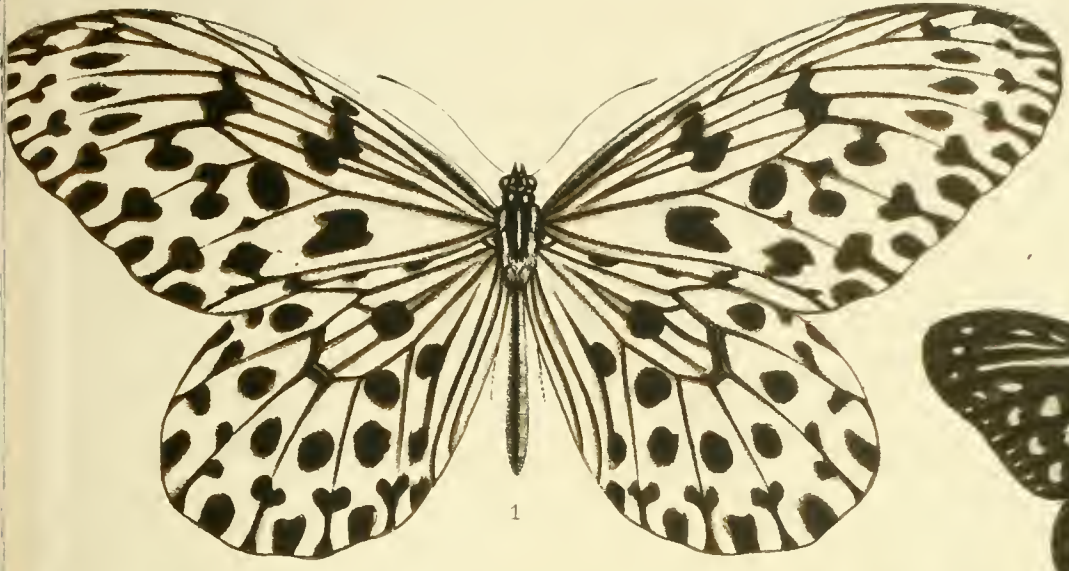
TAB. XLIII.

- 1, 2. *Euthalia merta*
3. " *bipunctata*
4. *Tanaëcia consanguinea*
5. *Elymnias abrisa*
6. *Euthalia zichri*
7. *Discophora sondaica*
8. *Neptis vikasi*  
var. *harita*
9. *Hestina nama*
10. *Eurytela castelnaui*
11. *Euripus halitherses*, var.
12. *Euthalia bellata*

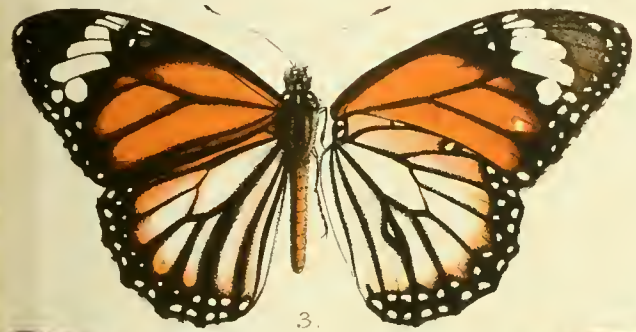
TAB. XLIV.

FIG.

- 1, 2. *Deudorix xenophon*
3. *Allotinus alkamah*
4. *Megisba thwaitesii*
5. *Zizera usta*
6. *Cyaniris jyntheana*
7. " *placida*
8. *Nacaduba macropthalma*
9. *Lycanesthes bengalensis*
10. *Cyaniris* sp. ?
11. *Drupadia moorei*, var.
12. *Sinthusa amba*
13. *Polyommatus bagus*
14. *Curetis æsopus*
15. *Catochrysops enejus*
16. *Logania sriwa*
17. *Everes exiguus*
18. *Narathura buxtoni*
19. *Sinthusa amba*
20. " *amata*
21. *Lycanesthes tessellata*
22. *Lampides abdula*
23. *Horaga halba*
24. *Iraota nila*
25. *Platingia hieroglyphica*
26. *Catapœcilma bubases*

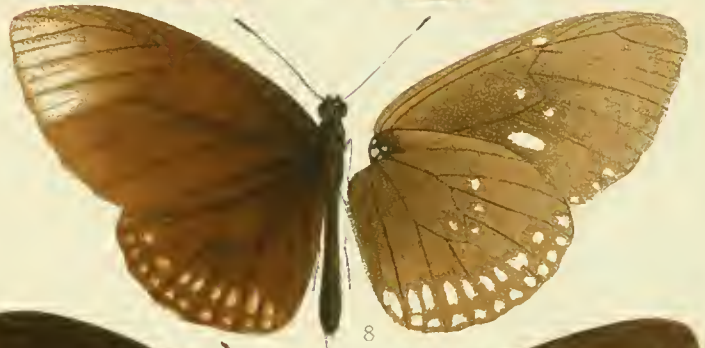


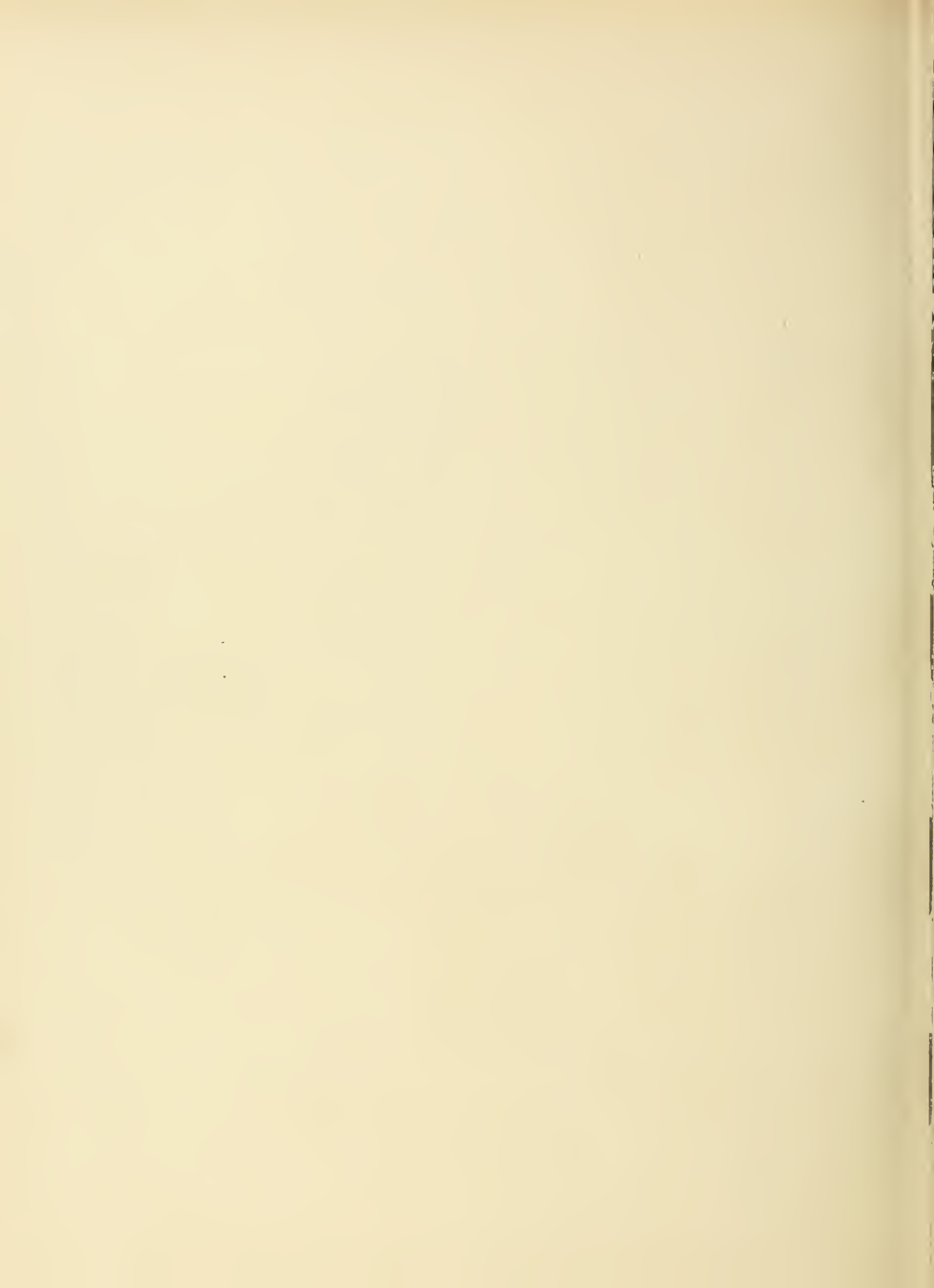


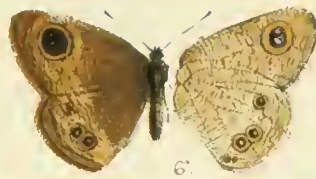


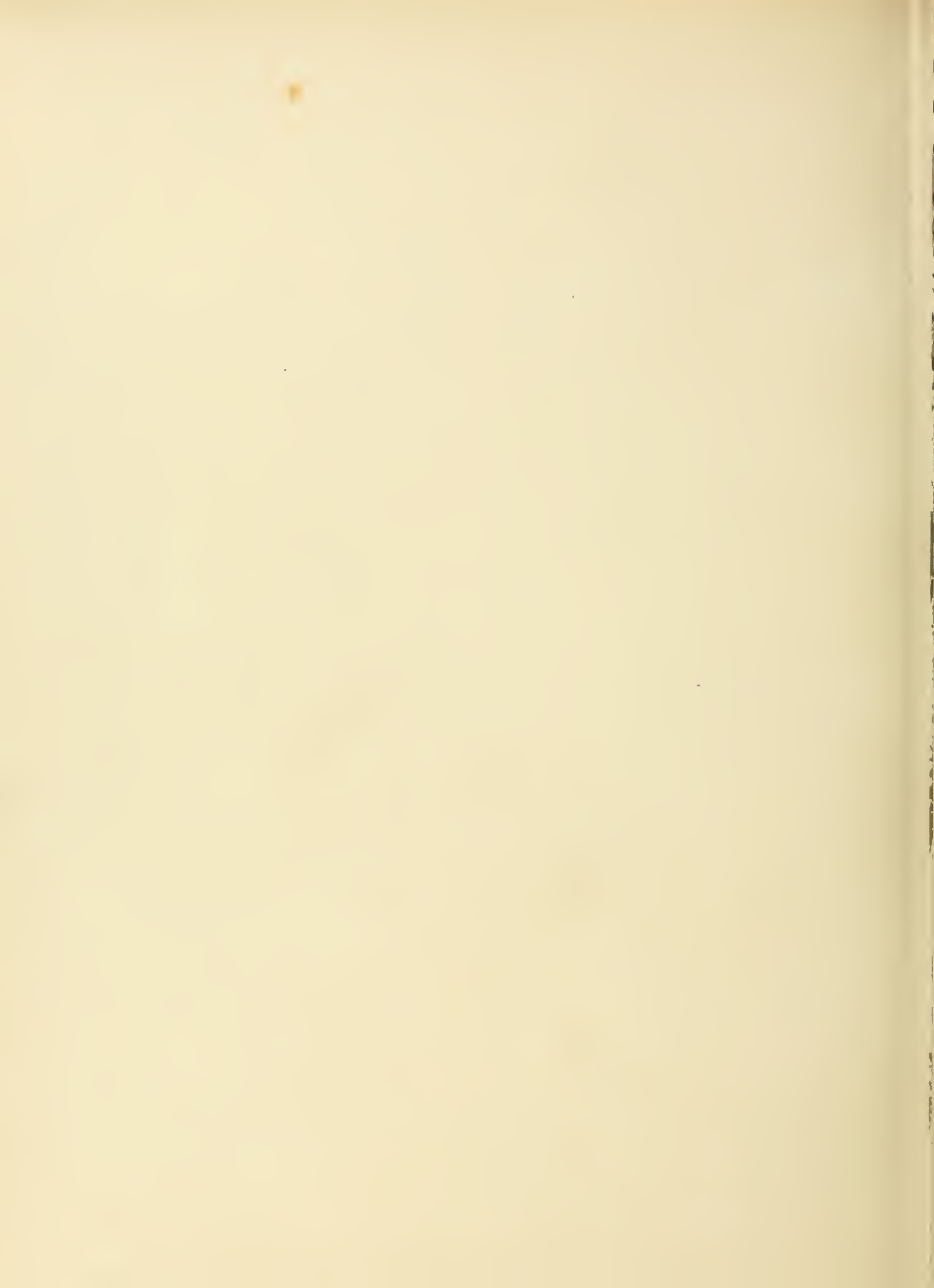


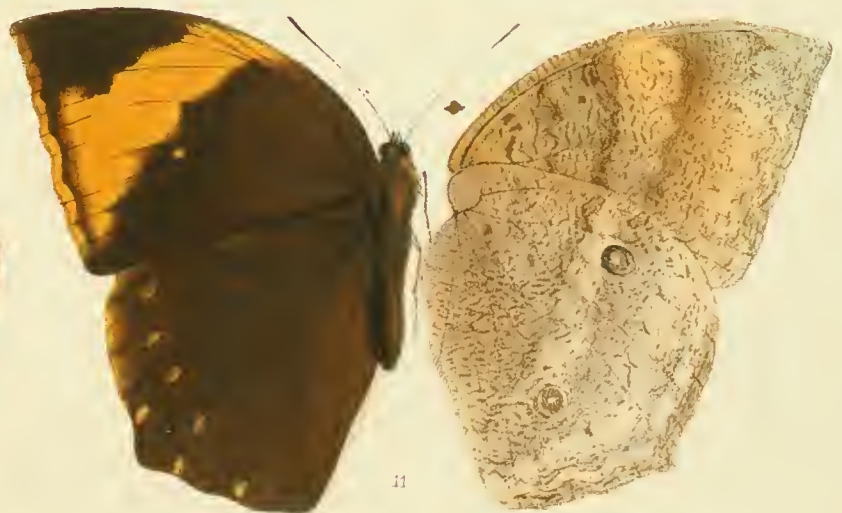
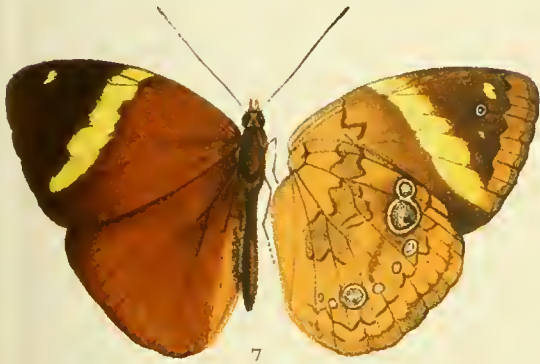
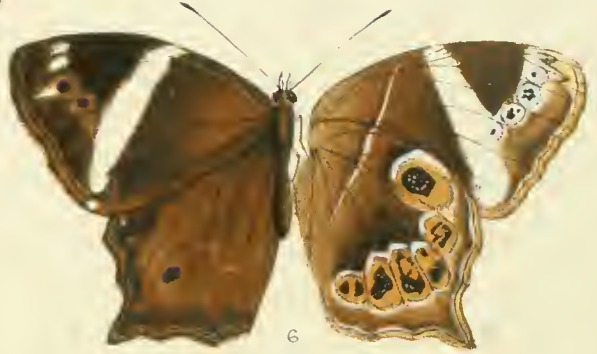
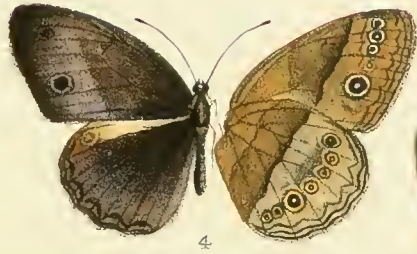
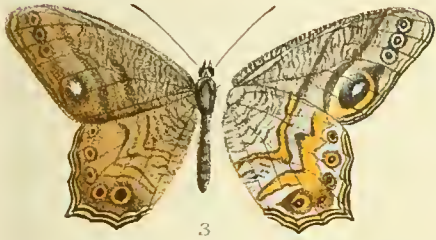
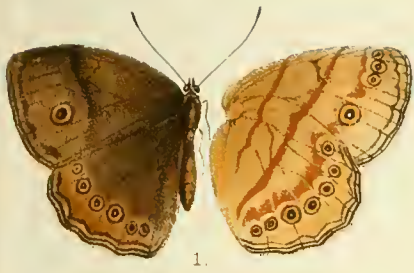


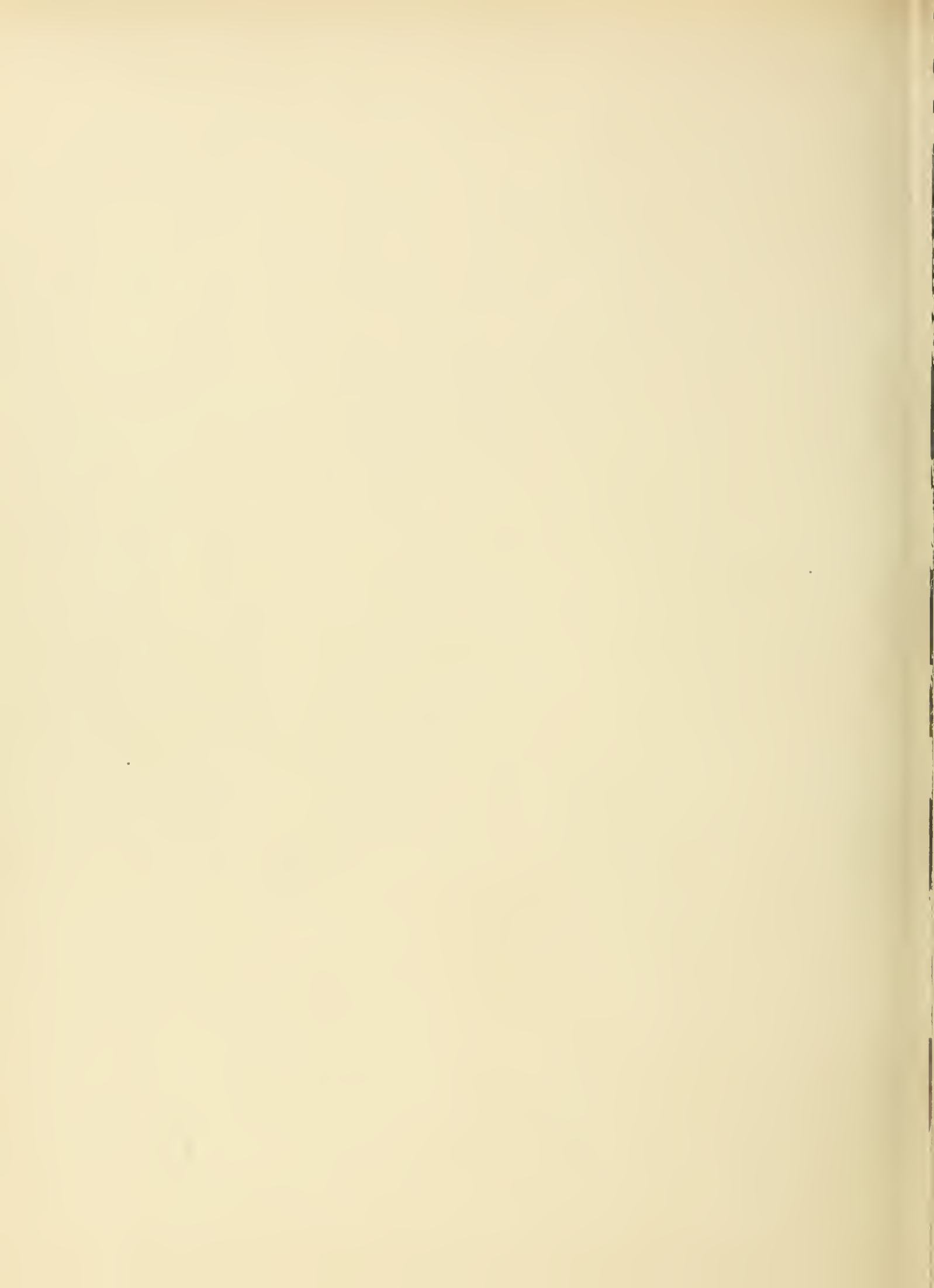
















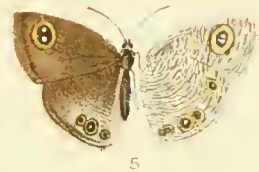




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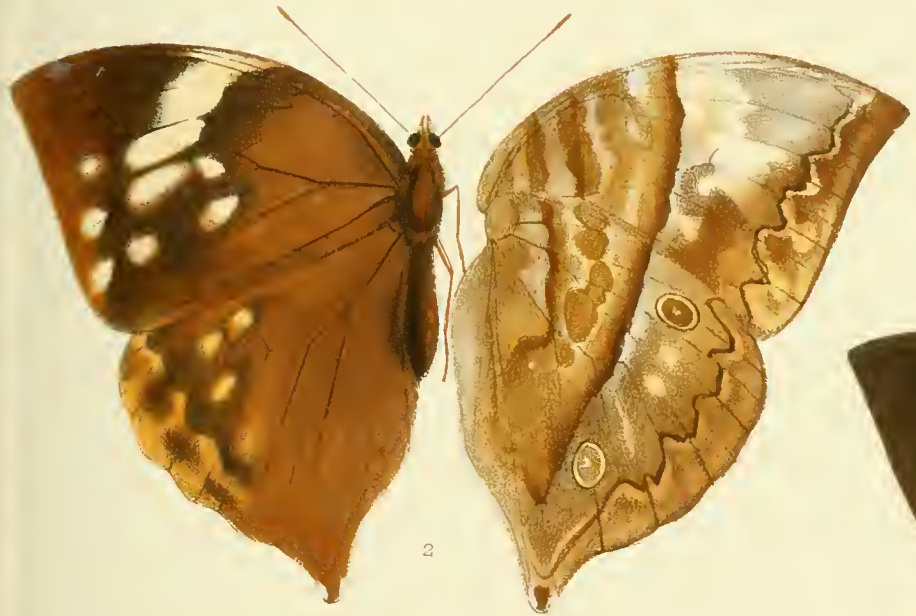
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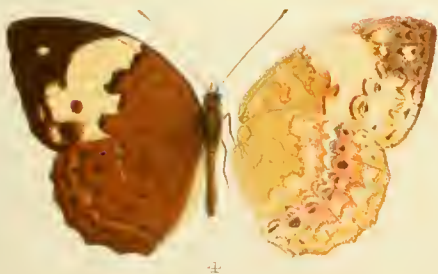
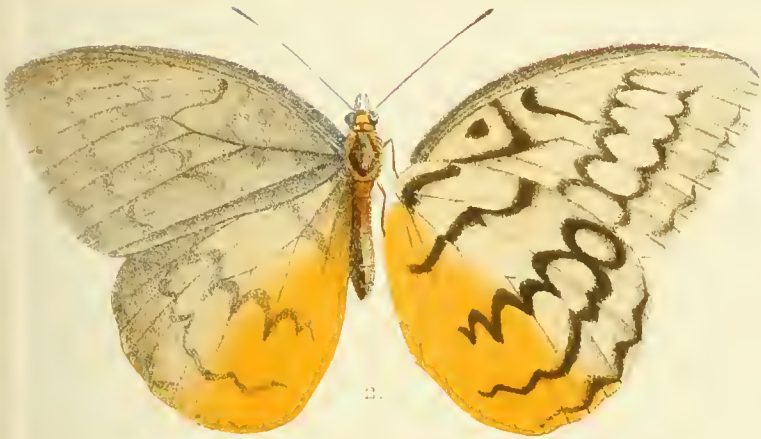


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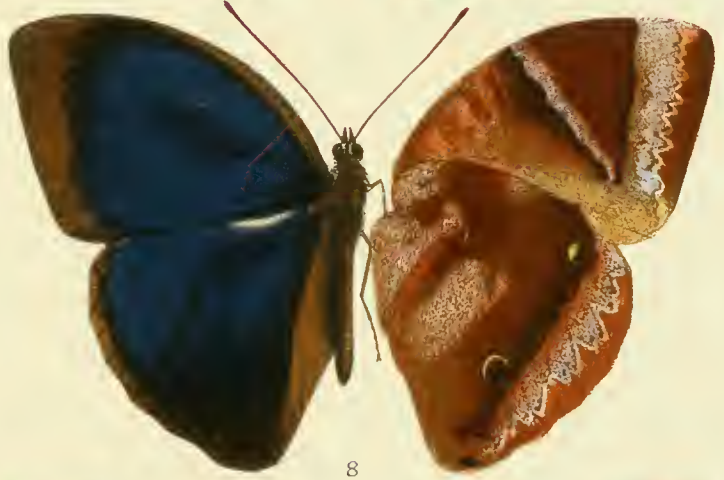
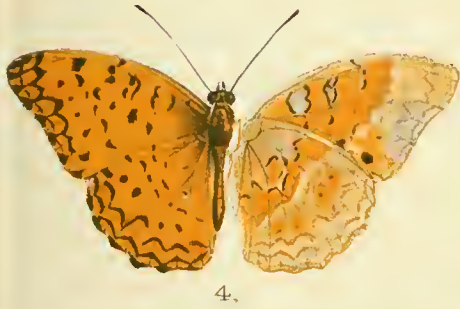
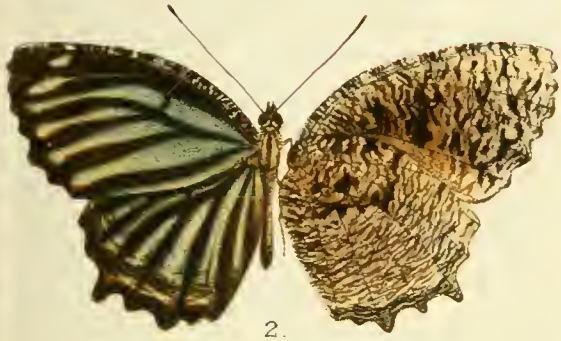


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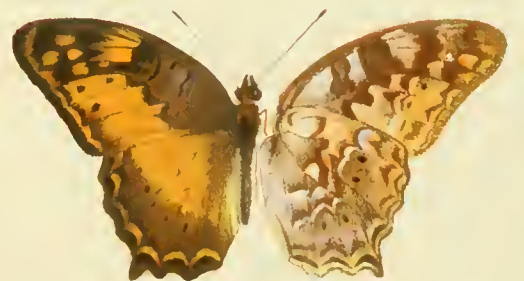
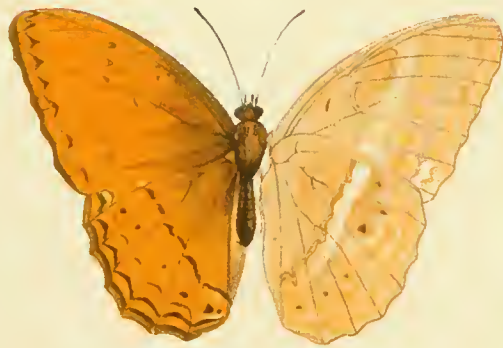
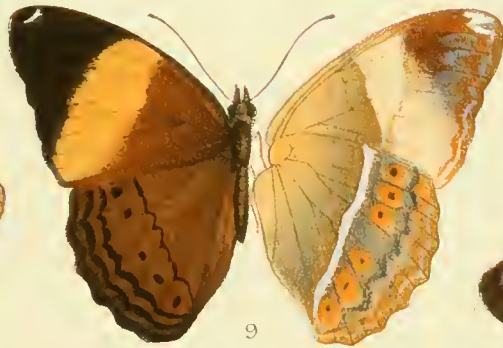
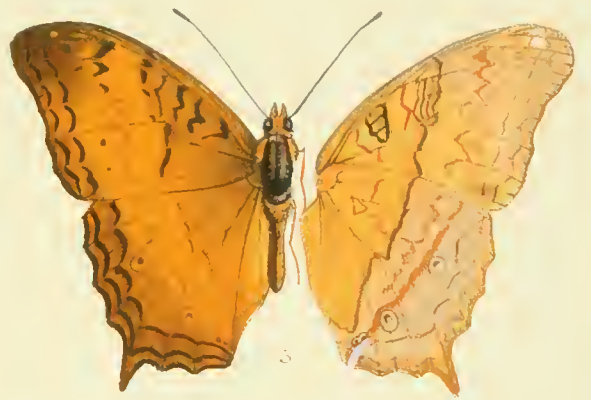
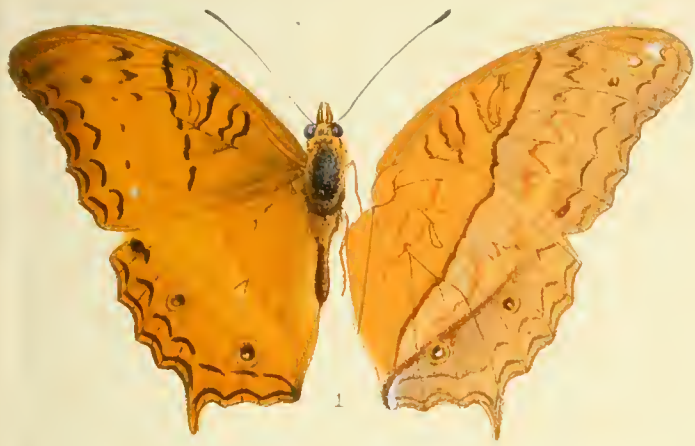






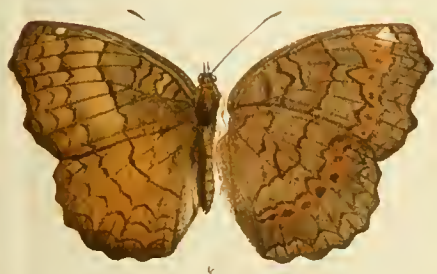
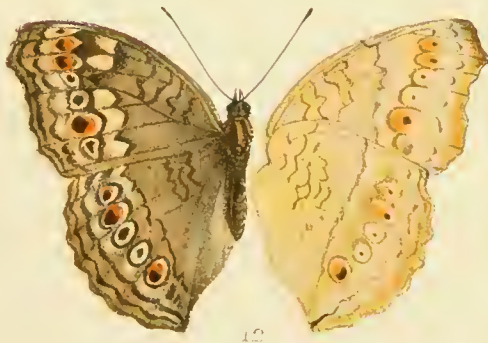
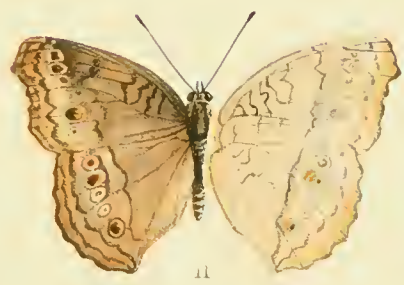
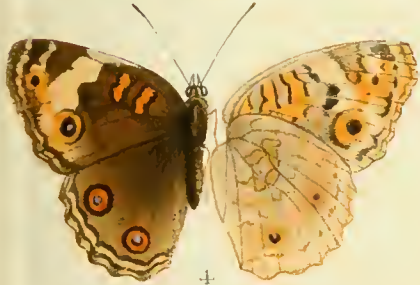
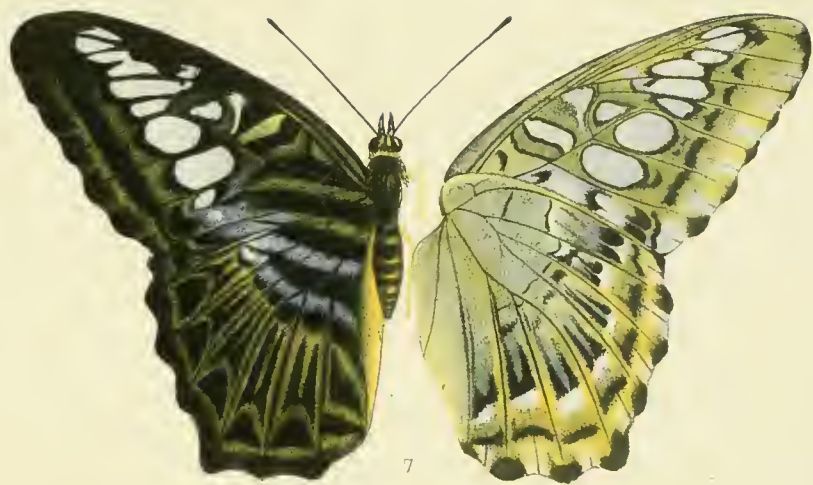












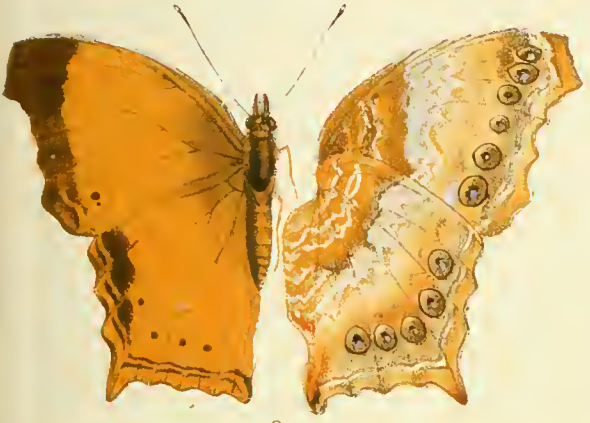




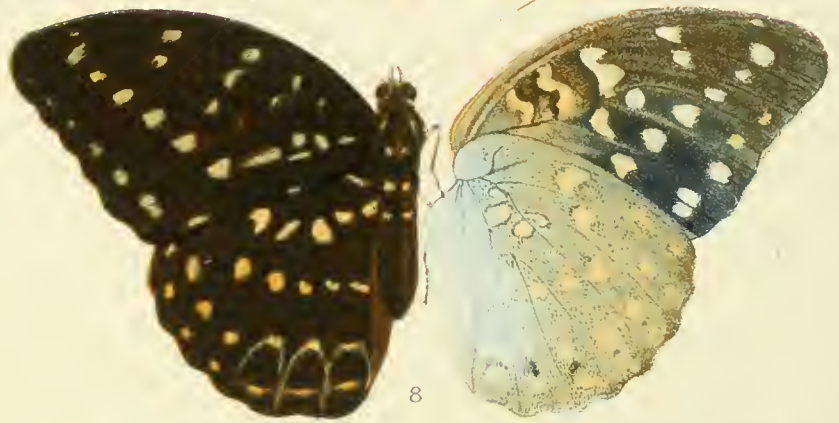
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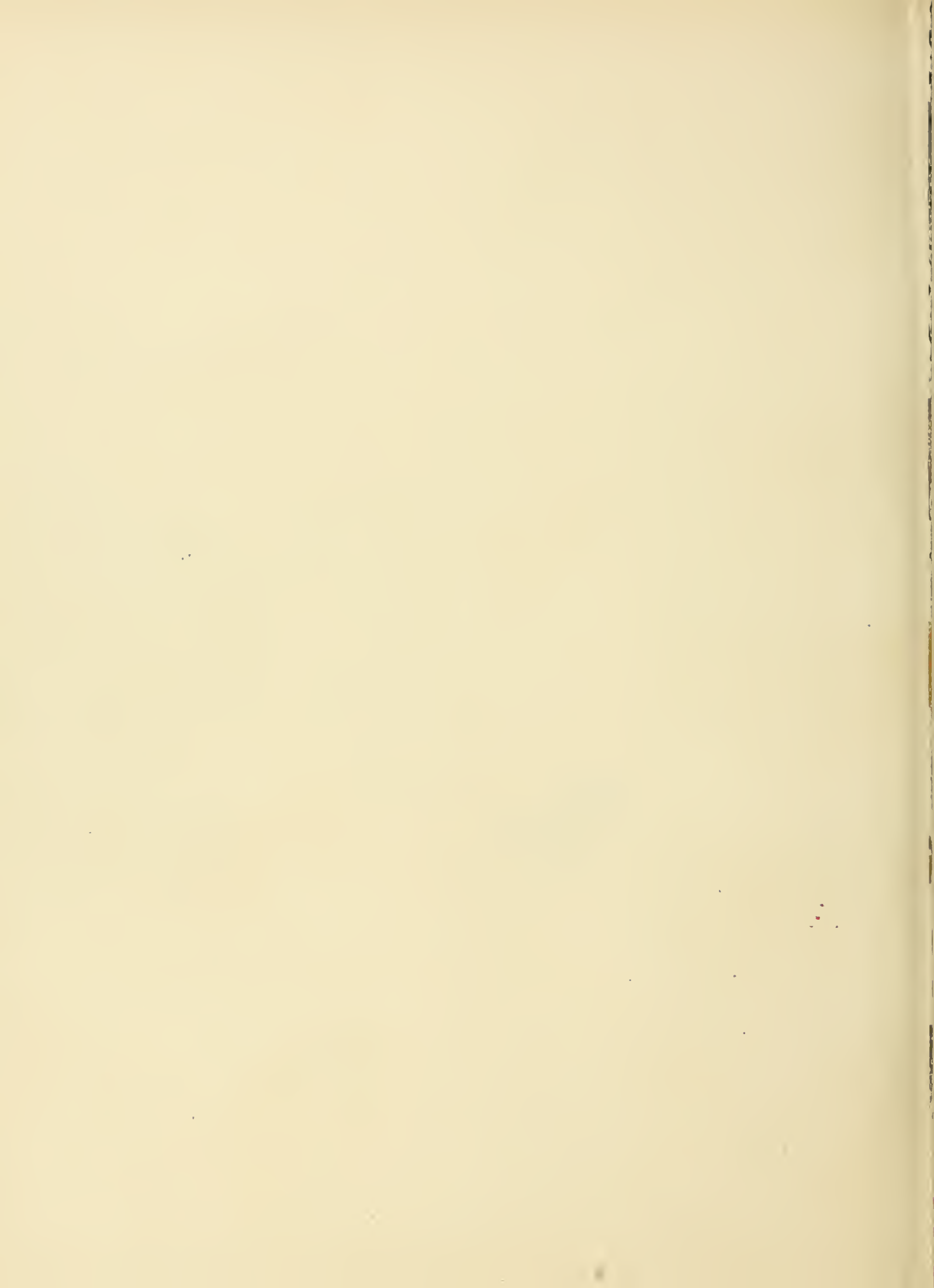
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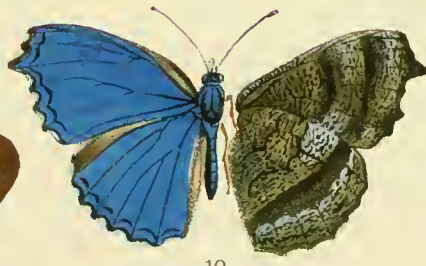
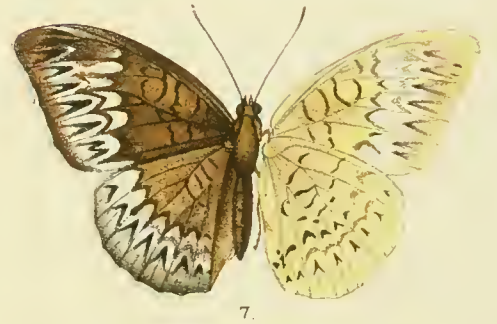
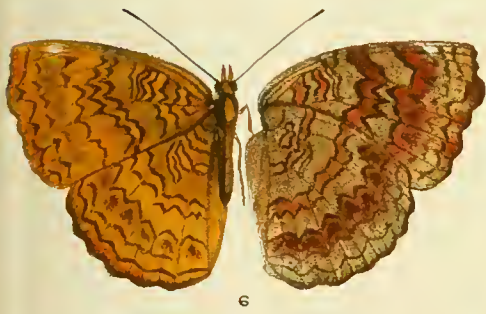
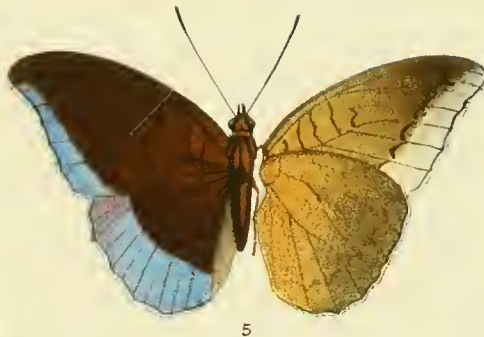
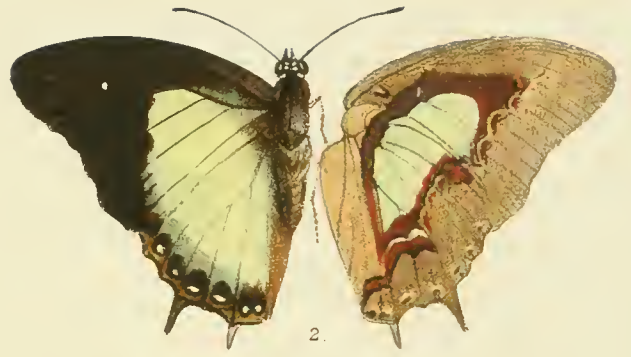
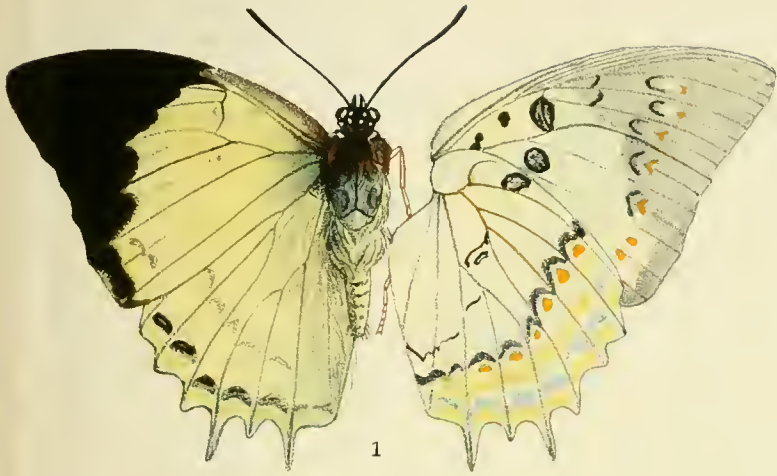












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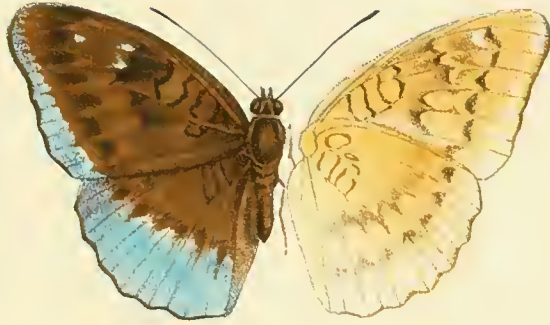




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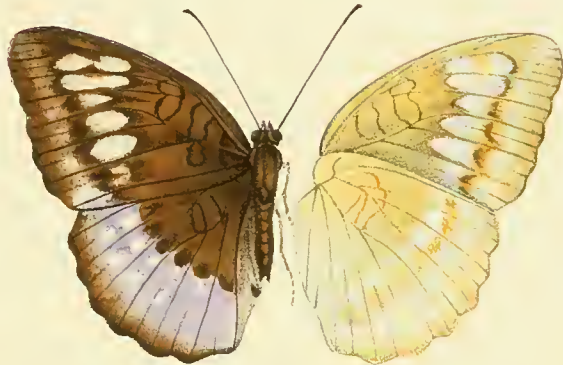
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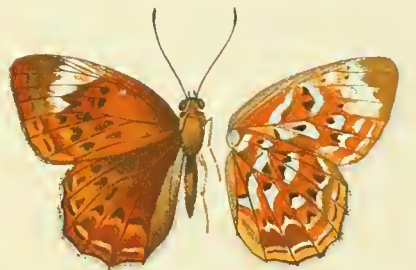
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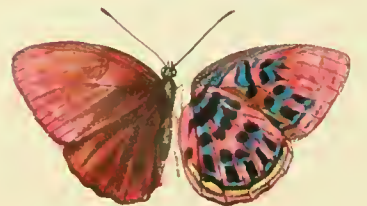
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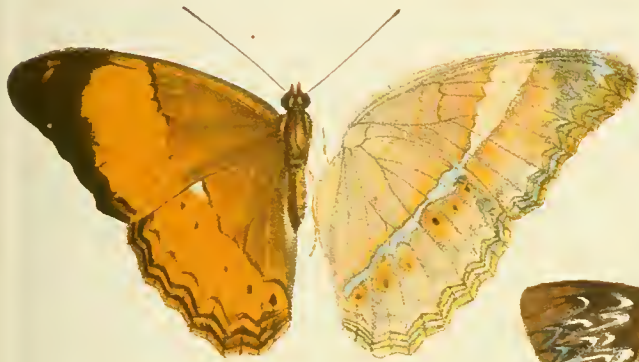
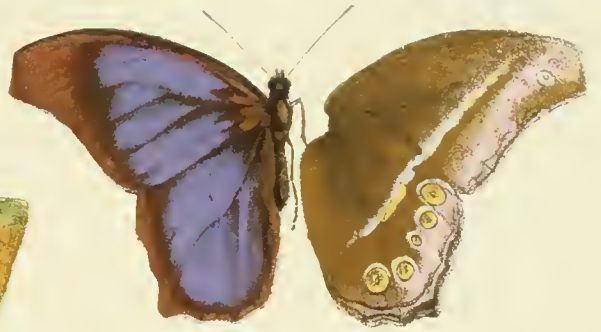
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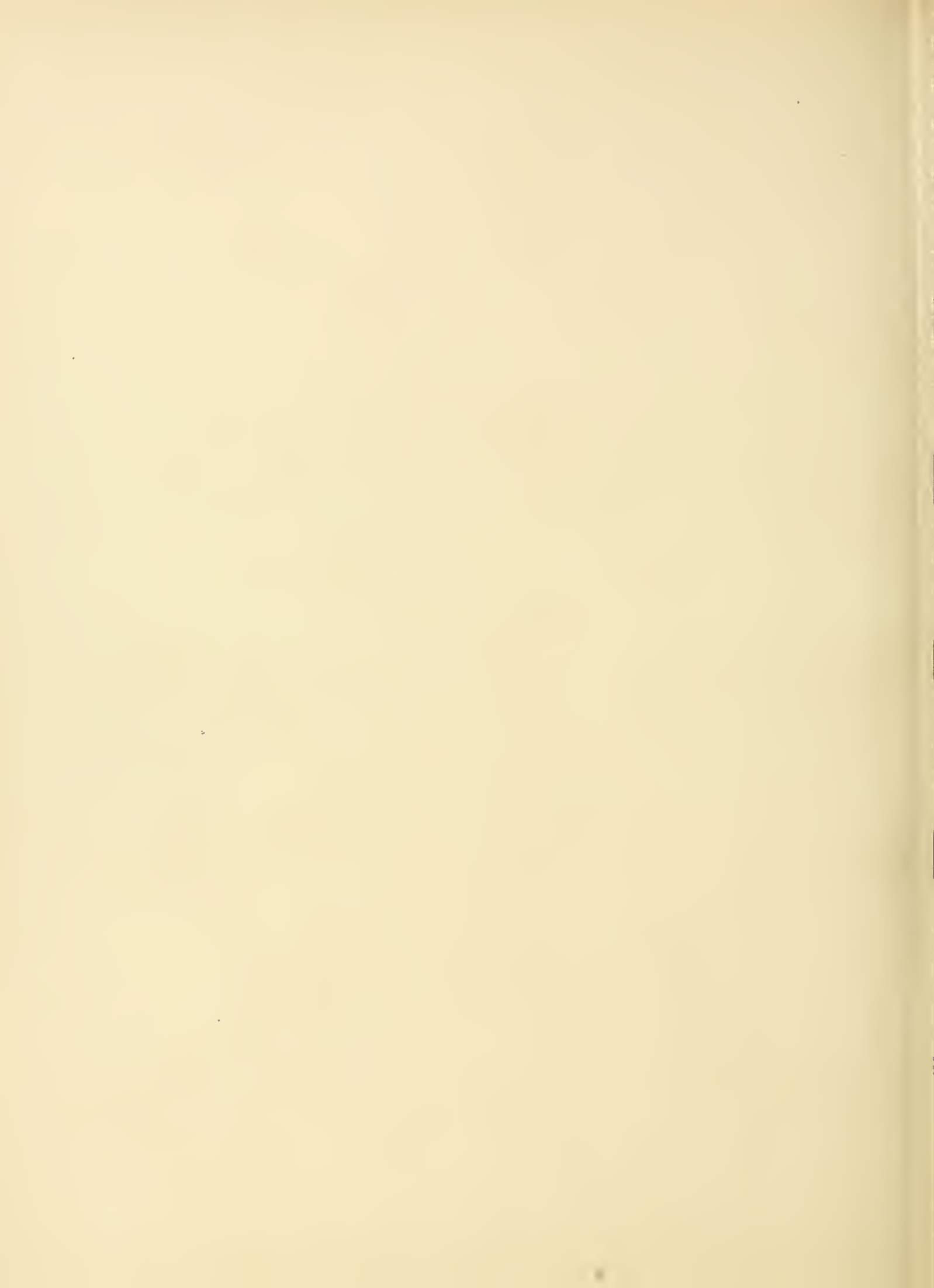


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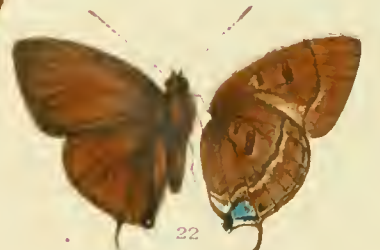
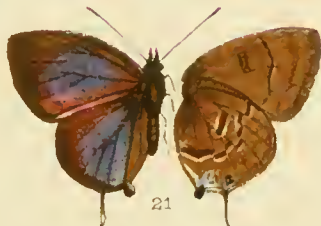
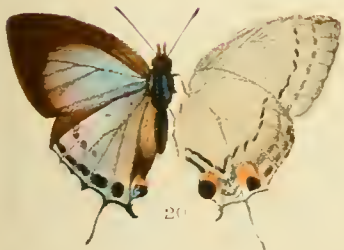
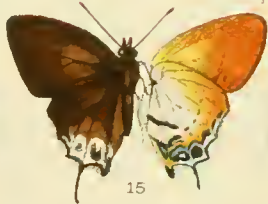
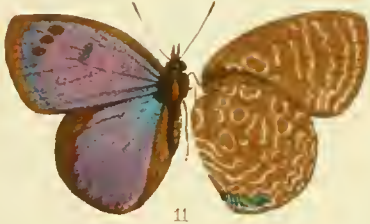
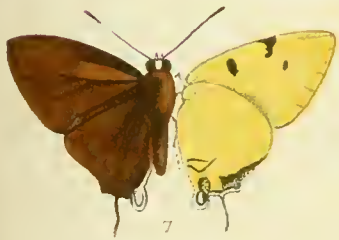
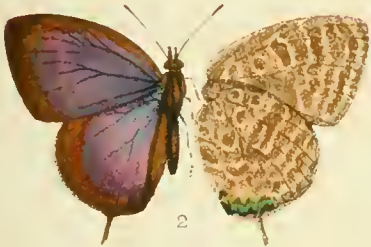
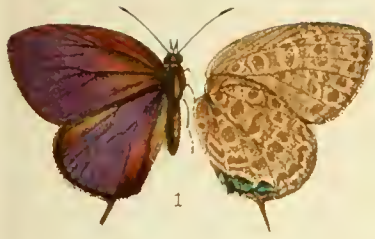












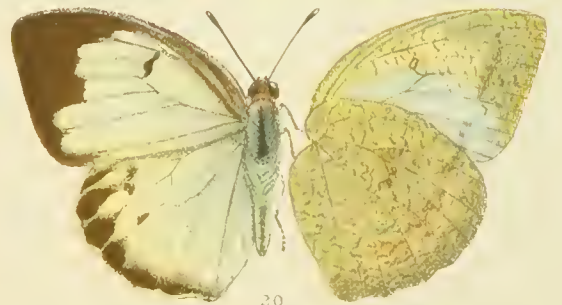
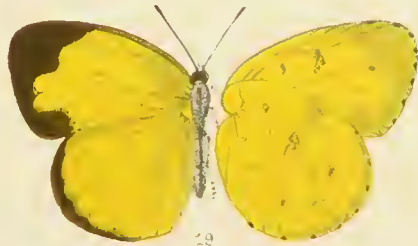
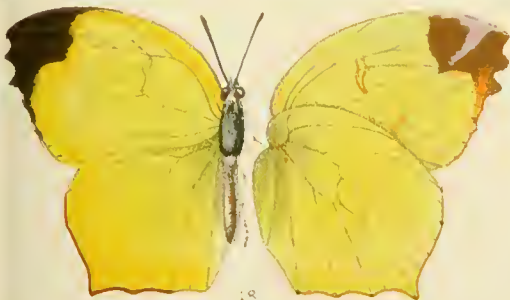
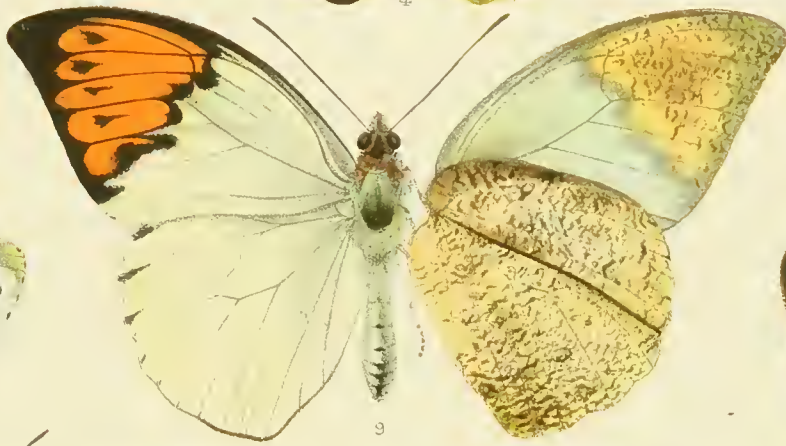
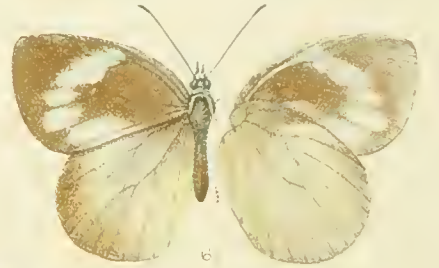
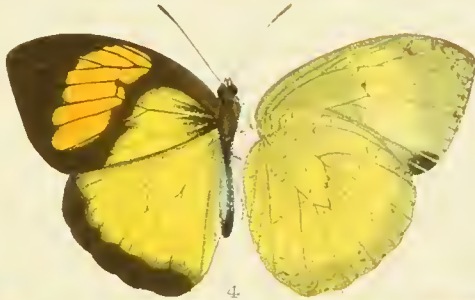
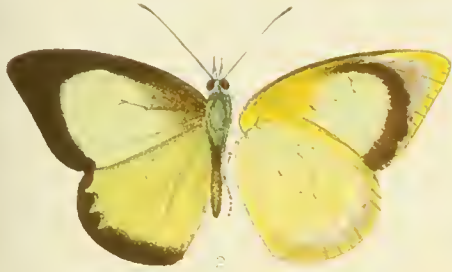
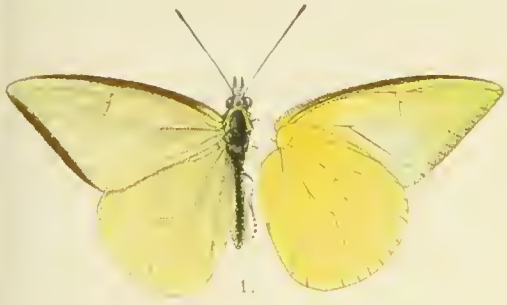










































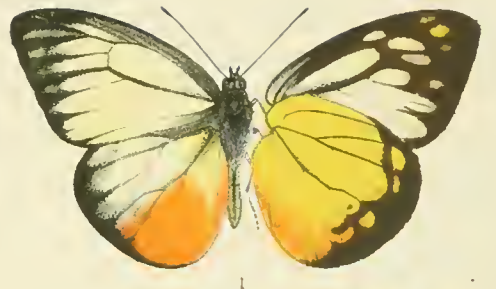
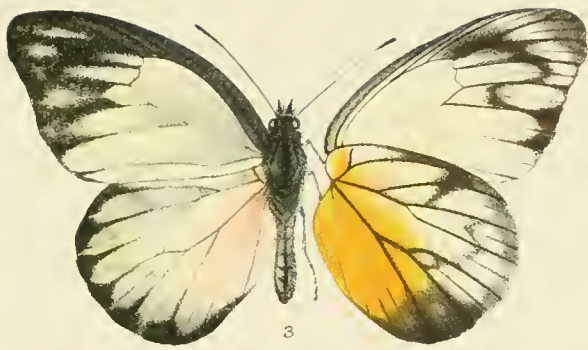
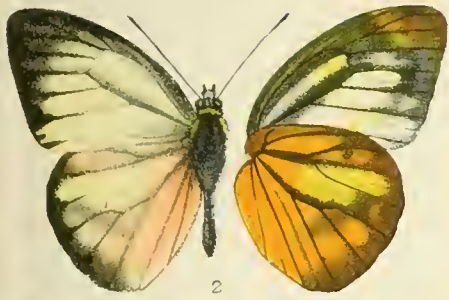












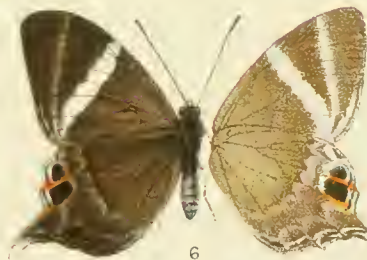
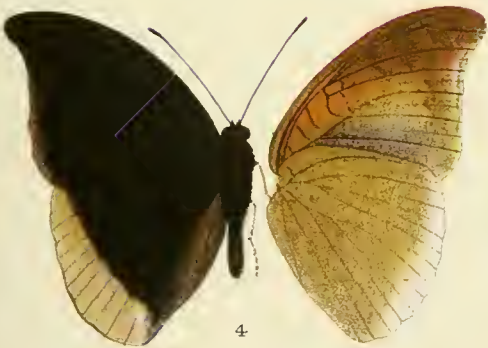
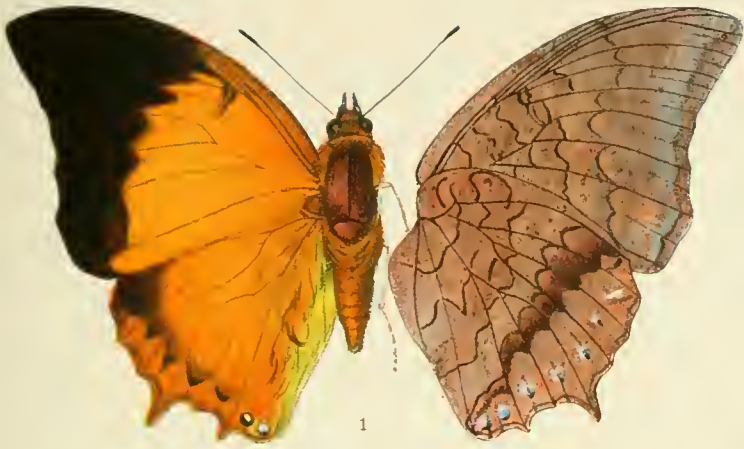






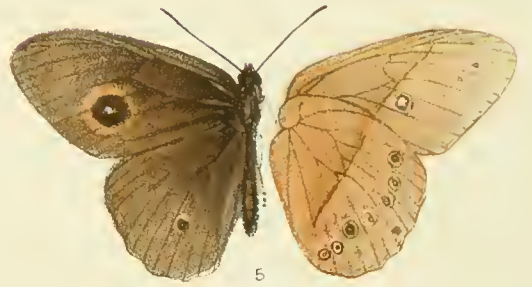
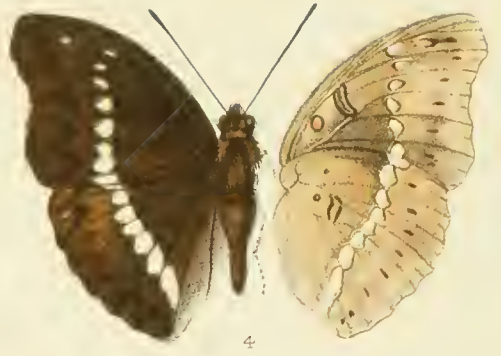




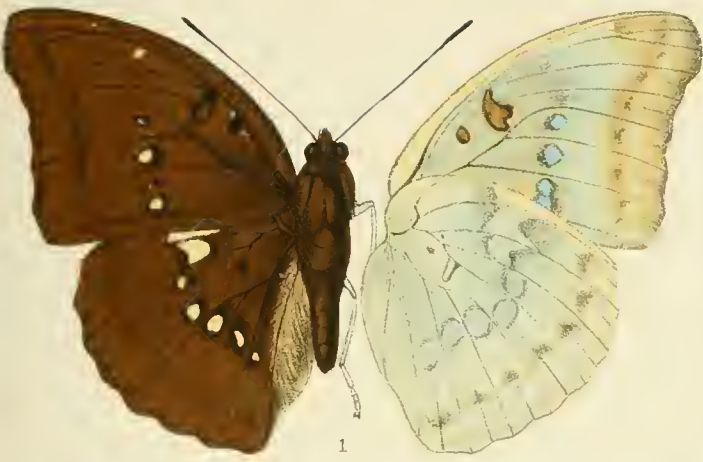




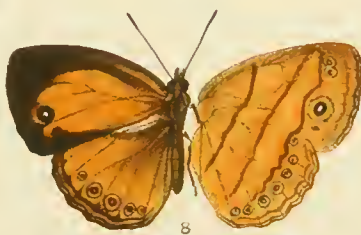
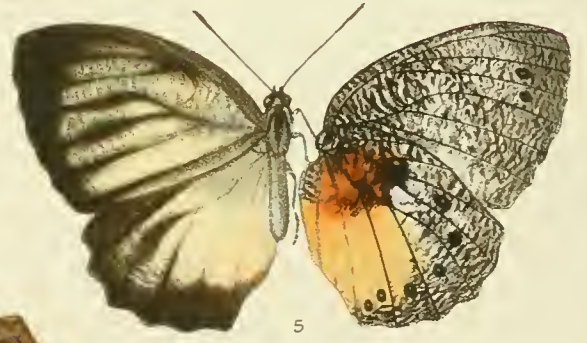
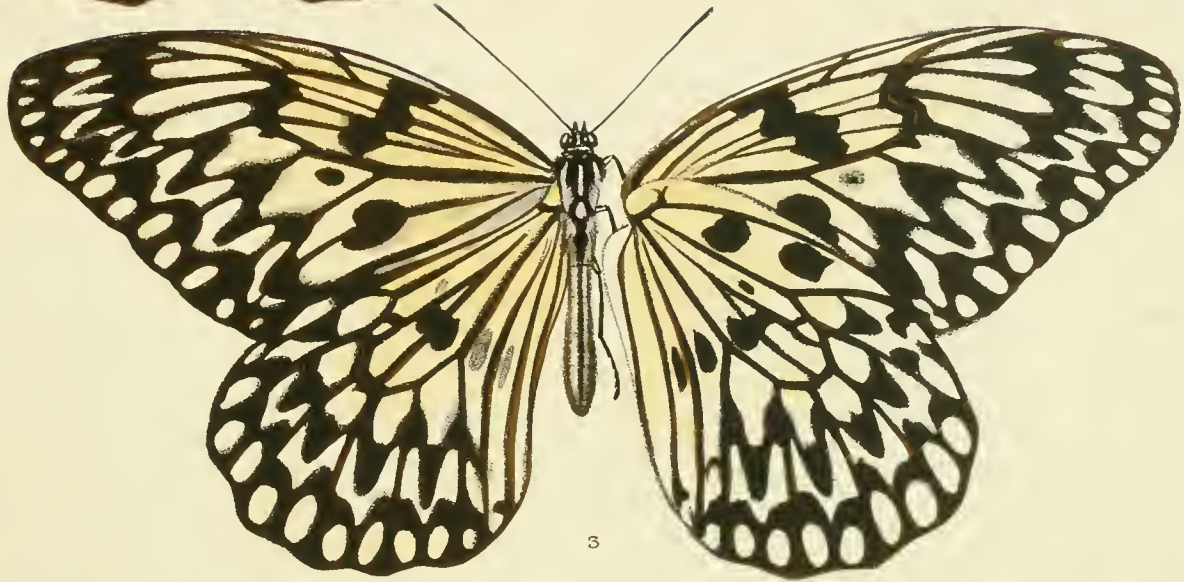
















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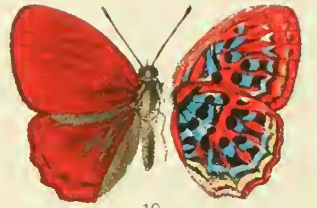
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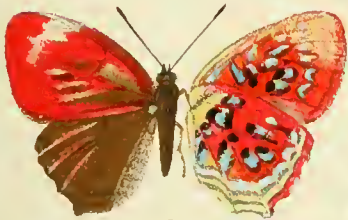
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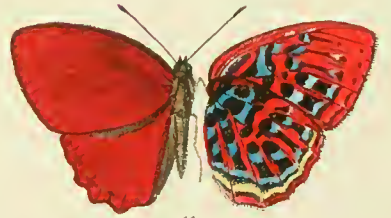
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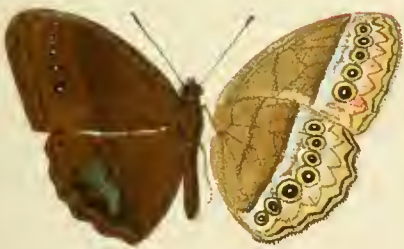
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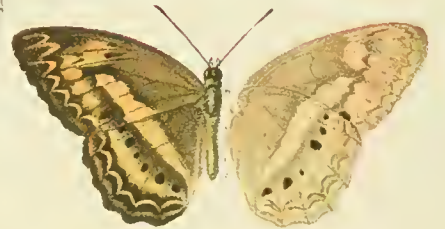
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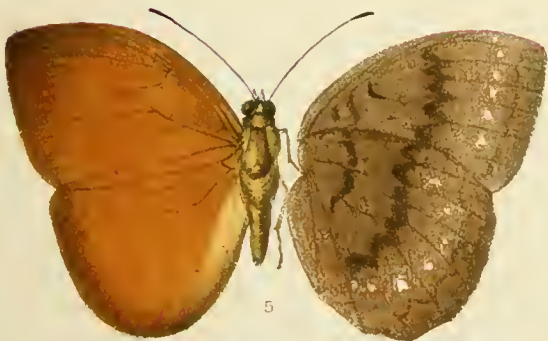
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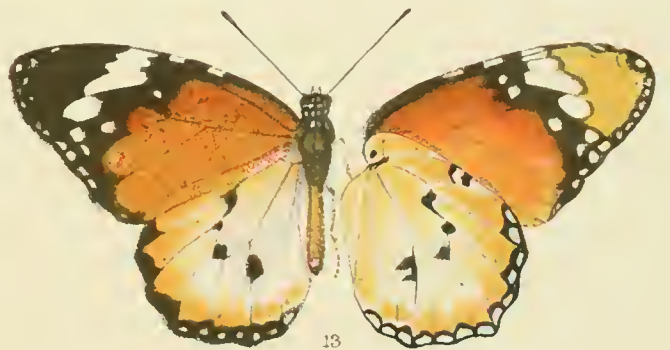
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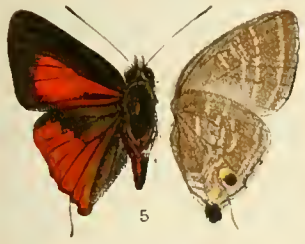
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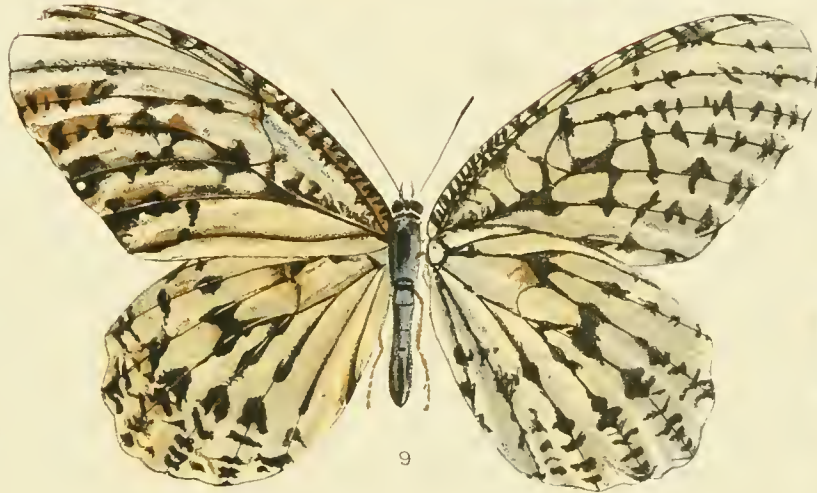
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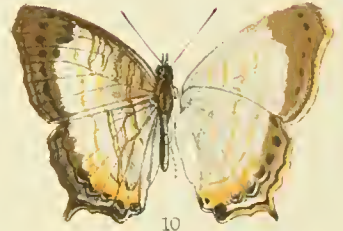
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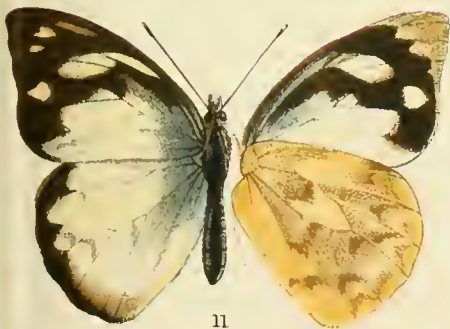
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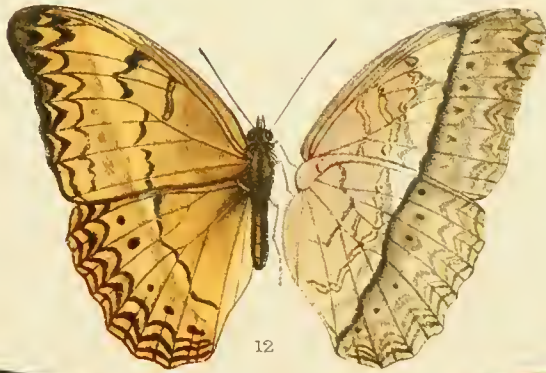
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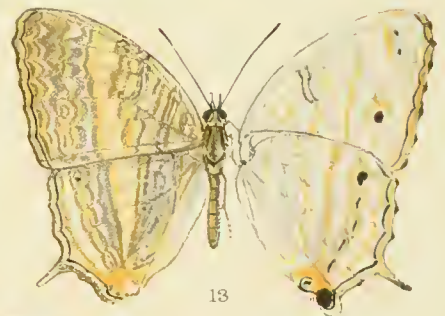
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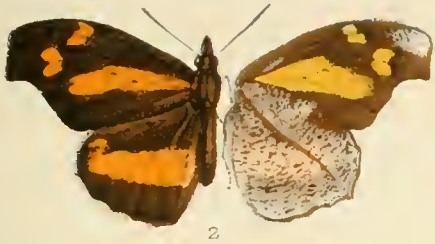


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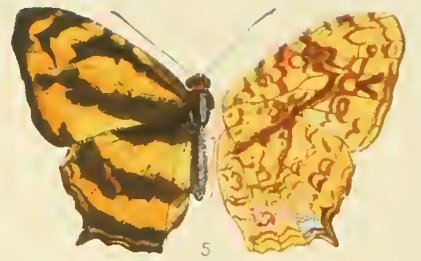




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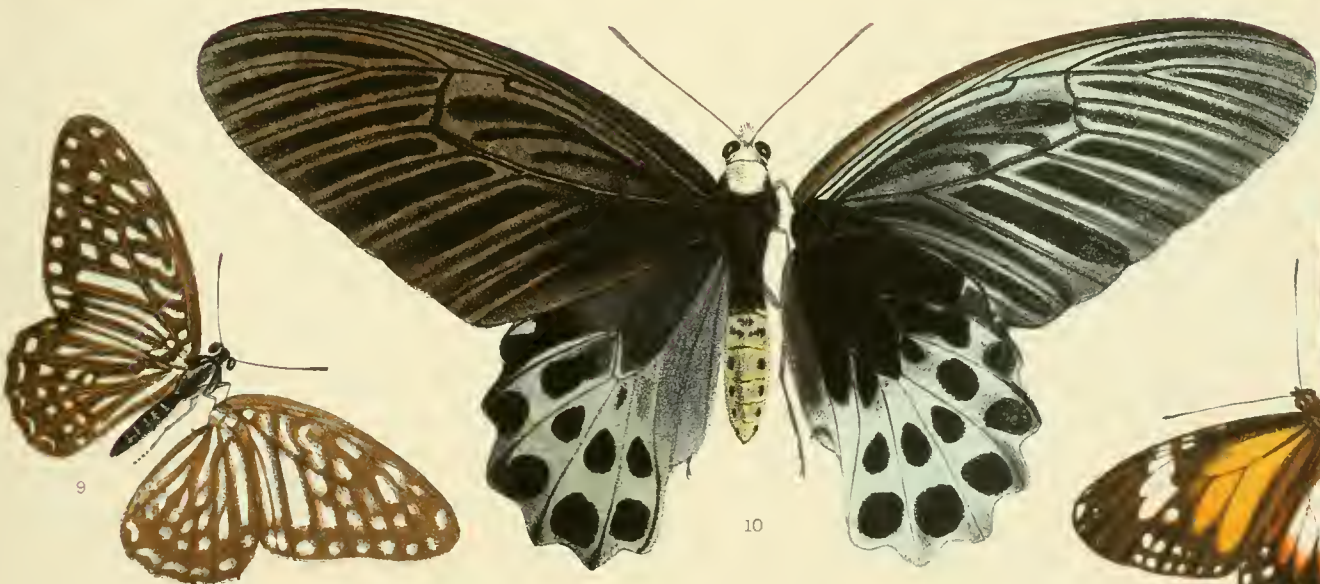
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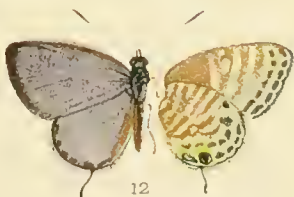
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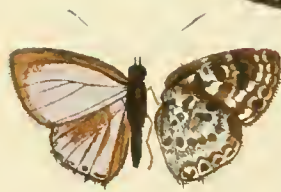
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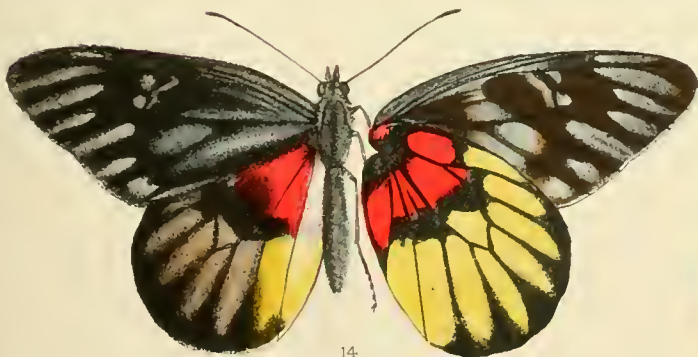
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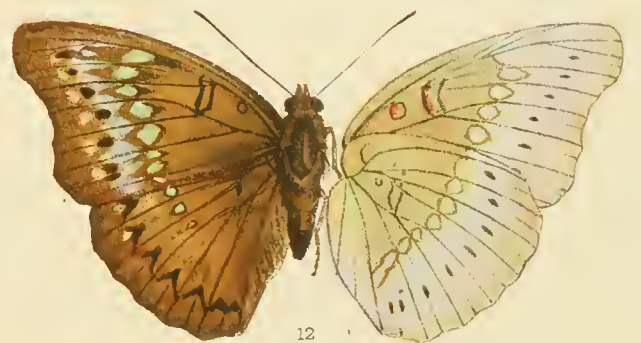
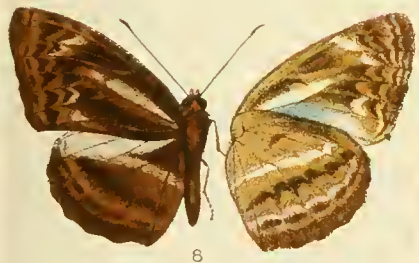


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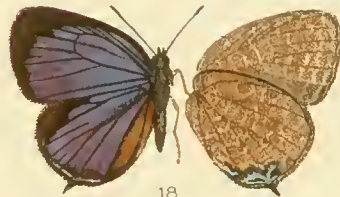
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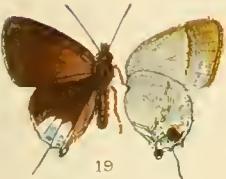
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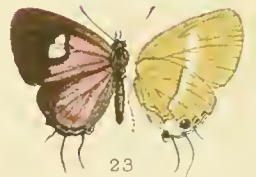
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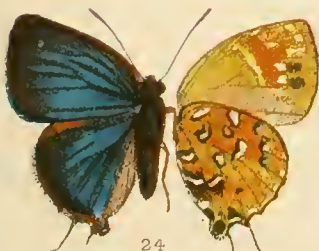
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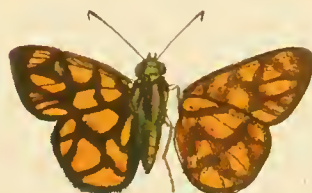
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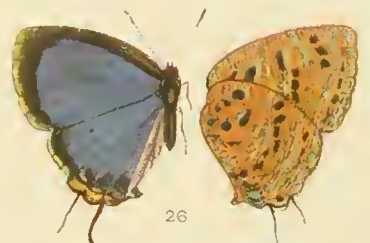
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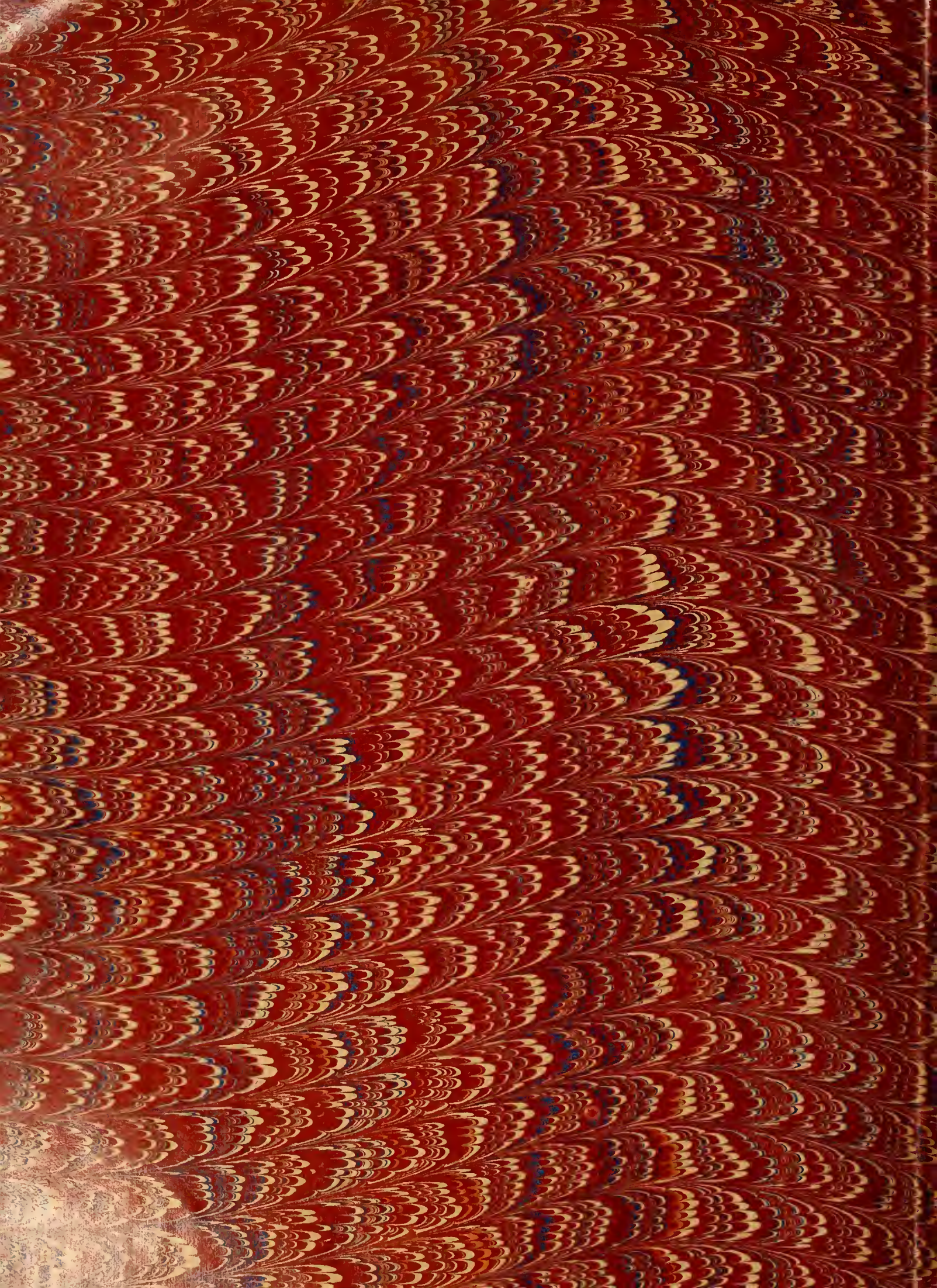


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