

Fam. 15. CONOPIDÆ.

The *Conopidæ* are probably about fifty in number, and are nearly all contained in the genus *Conops*, which Rondani has divided into several ; the latter may be considered as sub-genera. Macquart has established the following more distinct genus :—

- * Antennæ on the sides of the porrect front. *Pleurocerina*, Macq.
- ** Antennæ at the tip of the porrect front. *Conops*.

XV. *On the Oriental Species of Butterflies related to the Genus Morpho.* By J. O. WESTWOOD, Esq., F.L.S. &c.

[Read March 3rd, 1856.]

THE beautiful insects which form the subject of the present communication are the eastern representatives of a group of butterflies of large size, which, with these oriental exceptions, are exclusive natives of the new world, and which in respect to their size may be ranked amongst the largest known species of butterflies, and in the brilliancy of the colours of many of the species and the grandly ocellated markings of their wings, may equally vie in beauty with any of their rivals. *Morpho Cypris* is in fact the empress of the butterfly world. In respect likewise to their natural relations, resulting either from their direct affinities with other groups of butterflies, or their more distant analogies both with other butterflies and other tribes of animals, invertebrated and vertebrated, these insects are so interesting, that I cannot but think that a few remarks, with reference especially to such relationships as they exhibit, may not be without advantage (affecting as they do the primary distribution of the whole of the butterflies—*Lepidoptera Diurna* or *Rhopalocera*—as well also as that of the primary groups of the *Annulosa* themselves), at a time when Lepidopterology counts so many votaries, who, however, for

the most part never give a thought to the higher objects of zoological study, but content themselves with capturing or rearing, and occasionally describing, new or rare species of moths and butterflies.

In thus recalling attention to the remarkable principles which have been laid down within the past thirty years as regulating the natural distribution of animals, I do not think I shall run any risk of being regarded as upholding that doctrine of Linnæus, thrice repeated in his "Philosophia Botanica," that the true end of our science is the discovery of the natural system,* or arrangement of natural objects with reference to each other, to the manifest disparagement of those higher inquiries into the manners and customs, economic uses or injuries, and all those other relations of life, of an animal in reference to its operations in the universe, which St. Pierre has so excellently expressed under the title of "Harmonies of Nature," and for the performance of which it has in fact been called into existence.

If the *Γνωθι σεαυτὸν* of Solon was accounted the chief of the seven sentences of the seven wise men of Greece, written in letters of gold on the temple of Diana, and was in more recent times employed by Linnæus as the specific character of the human race (*HOMO SAPIENS*, *Nosce teipsum*, *Syst. Nat.* i. 28), so in respect to natural objects, the naturalist must make himself thoroughly acquainted with every peculiarity in the structure and habits, transformations and physiology of the objects of his study. To attempt the description of an animal before its structure has been thoroughly investigated, or to construct systems of nature (which may indeed appear plausible upon paper) before a profound investigation has been made of the same peculiarities in each of the primary types or groups, is but to build houses on the sand, to be washed down by the tide of knowledge, as it is more and more swollen by the accumulation of fresh facts. "FACTS BEFORE THEORY" has indeed been my motto ever since I commenced the study of insects. But still inquiries as to the principles of the natural system of the creation and theories formed with a view to its elucidation, even if occasionally false, are unquestionably valuable, because it has always happened that the promulgation of

* "Methodi naturalis fragmenta studiosæ inquirenda sunt. Primum et ultimum hoc in Botanicis desideratum est" (p. 27). "Methodus naturalis est ultimus finis Botanices" (p. 101). "Classes quo magis naturales, eo, ceteris paribus, præstantiores sunt. Ad fines conveniunt habitu —, &c. Summorum Botanicorum hodiernus labor in his sudat et desudare debet. Methodus naturalis hinc ultimus finis Botanices est et erit" (p. 137).

such theories has constantly been attended with new suggestions, often highly original, interesting, and valuable; and thus no one can rise from a careful study of the theoretical portions of the works of MacLeay, Vigers, Horsfield, Swainson, or Newman, without being struck with the many new ideas which these writers have formed on the natural distribution and arrangement of the various objects of nature on which they have exercised their talents and ingenuity. That one and all of them should have occasionally bent or even sacrificed nature to theory is no more to be wondered at than the discovery of the true system of nature itself would have been with the few genuine materials we at present possess, accumulated as they have been within so few years.

Let us see, for instance, what are the chief points in a Lepidopterous insect which appear likely to be of importance in enabling us to judge of its natural relation and place in the system of nature. I do not here allude to its internal anatomy, although no one can doubt that this is even of higher importance than its external structure.

Structure of the egg and its peculiarities; external form of the larva at its different periods of growth; structure of its mouth, spiracles, legs, prolegs, caudal appendages, &c.; external form and other peculiarities of the chrysalis, its mode of suspension or situation in a cocoon or otherwise; external structure of the perfect insect, including its antennæ, their form and number of joints, spiral tongue and palpi; eyes; legs, with their tarsi and unguis; form and position of the wings; arrangement of wing veins; abdomen and abdominal appendages in the opposite sexes, and other sexual differences; natural habits and economy; time of flight, geographical distribution, size, colour, and markings.

Now how many Lepidopterous insects have been studied in such a manner as will clearly enable us to form an opinion on all these various peculiarities and points of structure? Lyonnet spent a life in examining the goat moth, *Cossus ligniperda*, in its various states, but it is only the larval portion of his inquiry which he had time satisfactorily to complete. To affirm that any one of these peculiarities or characters is of superior importance to the rest, as affording a key to a natural system of *Lepidoptera*, until such a thorough investigation has been made of one or more species in each of the principal groups of Lepidopterous insects, seems to me to be liable to lead to error, not only from positive want of knowledge of facts, but also from a want of recognition of that principle which seems to pervade nature, namely, that characters which in one group appear to be of primary importance, become

modified so greatly in another group as to lose their primary value, which is seen to be usurped by quite a distinct set of characters. Hence I consider that we are not in a position to assert that the genus *Papilio*, either on account of its minute palpi, or the arrangement of its wing veins, forms but a single genus, especially as the larvæ of various species are so very distinct in their forms, as may be seen in the plates of Dr. Horsfield's "*Lepidoptera Javanica*," or, on the other hand, to regard all the species of caterpillars which have furcate heads and tails as belonging to one primary division of the *Diurna*, thus separating *Apatura* from its allies, and bringing it with *Morpho* and *Hipparchia* into one group; or, again, to strike *Parnassius* and *Thais* from *Papilio* as a distinct sub-family, because the *Apollo* butterfly spins for itself a loose cocoon in a leaf like a moth, as Mr. Swainson has done in his *Nat. Arr. of Insects*, p. 76; or, lastly, with an imperfect knowledge of the larva of only a single species of *Erycinidæ* to unite that extensive group of butterflies with *Lycæna* and *Thecla*. I might also dwell upon the impossibility of satisfactorily arranging all those other groups of strikingly distinct types of form amongst exotic butterflies, of whose transformations we still remain ignorant, such as those typified by *Ageronia*, *Heliconia*, *Acræa*, &c.

But if we cannot (it would indeed be a most marvellous thing if we could), with our present state of knowledge, hope for the realization of our wishes in the discovery of the System of Nature, it is the more incumbent on us to collect materials for that purpose, and, by careful examination of such materials as we actually possess, to discover the relations of affinity between species and groups, and to point out the analogies which they exhibit with other groups.

The butterflies, then, which are the objects of the present paper are natives of India and the adjacent parts of the East. They are of a large or moderate size, with wings large in proportion to the body, and rounded; the hind pair in the *Amathusiæ*, *Zeuzidiæ*, and *Kallimæ*, having the anal angle produced into a long point, or a broad short tail, and the underside of the wings, especially of the posterior pair, beautifully ornamented with eye-like spots. In a few of the species the upper side is more or less tinged with a dark metallic purple gloss; the discoidal cell in the fore wings is closed, but that of the hind wings is open; the base of the latter pair of wings not being furnished with a small supplemental cell at the base of the submarginal vein. In the males of some of the species, the hind wings are ornamented with tufts

of long hairs, which the insect can doubtless erect and depress at will. The antennæ are long and but moderately clubbed; the palpi are of moderate length and breadth, the fore legs reduced to a very small size, incapable of walking. The little that is known of the preparatory states of these insects teaches that the caterpillars are cylindrical, with the head cornuted or forked, and with the extremity of the body terminating into two points or tails.

Now there are three modes of looking at an animal with reference to the remainder of the creation. Either the species is to be considered, as completely independent of all other species, and produced for a given end, without reference to any other animal, or the species is to be regarded with especial reference to such species as are approximated to it by similarity of structure, which constitutes that relationship which has been termed affinity; or thirdly, the species is to be examined, not only with reference to its direct affinities, but also in respect to its resemblance to other and more distant tribes, which constitute the principle which has been termed analogy.

This is not the place to enter into very lengthy observations on these different relationships. The *Horæ Entomologicæ*, the latter volumes of the Introduction to Entomology, and various detached memoirs by Messrs. MacLeay, Kirby, Vigors, Horsfield, Swainson, &c., may be advantageously consulted; but I apprehend that no one will venture to deny the existence of these different kinds of relationships, although they may, and probably will, differ as to the mode of their application in reference to the discovery of the natural system.

Mr. MacLeay, indeed, regarded relations of analogy as of the highest value in testing the natural arrangement of groups; and, taking as a starting point one of his five divisions of Annulose animals, namely, his *Ametabola*, he regarded the different resemblances or analogies which exist between the types of each of the five subdivisions of the *Ametabola*, and the larvæ of different tribes of Coleopterous insects, as affording a means of dividing the *Coleoptera* into so many primary groups, arranged in a parallel series with the five groups of *Ametabola*.

The same principle was applied by Dr. Horsfield to the *Lepidoptera*, in order to test the divisions (not of the whole order, but) of the Diurnal species, and on this principle five groups of *Diurna* were established, the resemblance to the *Chilopoda* (*Scolopendra*, &c.) being supposed to exist in those caterpillars which have a series of appendages or diverging spines along the sides of the body, recalling to mind in some degree the protruded numerous legs of the centi-

pede ; the resemblance to the *Chilognatha* (*Julus*, L.) being effected by those caterpillars with cylindrical bodies and legs short ; the resemblance to the *Thysanuræ* (*Lepisma*, L.) being found in those caterpillars which have the body terminated in two elongated points ; the resemblance to the *Anoplura* (*Pediculus*, L.) being found in the larvæ of *Hesperia*, having a large head and a body terminated bluntly at its hind part, without any points or tails ; and the resemblance to the *Vermes* of MacLeay being supposed to occur in the short onisciform larvæ of the *Lycenidæ*.

Mr. Swainson extended these analogies beyond the *Annulosa*, and, adopting the five divisions of *Diurna*, he pointed out the resemblance of the caterpillars of the Thysanuriform division, to which the *Morphidæ* are referable, (to which, however, he adds the *Satyridæ*,) with the *Gallinacæ* or *Rasores* among birds, and the horned cattle, or *Ungulata*, among quadrupeds, which are the only ones in their respective classes which have horned crests or pointed appendages on their heads. So also the tails of these larvæ are indicated as pointing to the greatly elongated tails of the peacock, pheasant, and others Gallinaceous birds, as well as to the horse, which has the most beautiful tail among quadrupeds. So again the most bulky quadrupeds are found among the *Ungulata*, and the *Morphos* of South America are the giants among butterflies ; the largest birds also occur in the rasorial order, whilst on looking at the perfect insects almost all the butterflies are distinguished by the beautiful ocellate spots on the underside of their wings, just as the peacock, &c. are pre-eminently ocellated in their markings, "and the general structure of all those insects, even those of the largest, is weak."

To deny the existence of such resemblances as are here detailed would be to shut our eyes to some of the most interesting and beautiful harmonies of nature ; but on the other hand it seems to me equally unsafe to affirm, in the present state of our knowledge of the structure and transformations of insects in general, or of the *Lepidoptera* in particular, either that the characters alluded to above possess the importance here given to them, or that the relations resulting from their resemblance to the analogous peculiarities in other tribes of animals, is of itself a sufficient proof that the natural progression of the two sets of groups of animals must necessarily be parallel, the arrangement of one pointing out and testing the arrangement of the other by the existence of different points of resemblance, such as has been indicated above.

Now the genera which have the larvæ furnished either with a bicornuted head or a bifid tail are very varied, not only in the

perfect state, but also in the general character of the caterpillars themselves; thus the larva of the genus *Diadema** has the head armed with two erect spines, but each of the following segments has several shorter spines, which is the character of the true Chilopodiform larvæ of Dr. Horsfield. *Apatura Iris* has the larva very slug-like, being thickest in the middle of the body, the head furnished with two erect horns, the body attenuated behind and terminated by a bifid point; the surface of the body is finely shagreened, and with slender oblique pale yellow lines at the sides. The larvæ of *A. Clyton* and *Celtis* are more elongated, the head with two branches or bifid horns or spines. (Bdv. and Leconte, Icon. Lep. Amer. Septentr.) The larva of *Nymphalis Jasius* (*Charaxes J.*, Ochs., Bdv.) has the body smooth, gradually attenuated behind, and terminated by a depressed bicuspidated tail, and the head armed with four obtuse horns. That of *Nymph. Athamas* (Horsfield, Catal. Lep. Ins. E. Ind. Comp. pl. 8, f. 7, is rather more elongated than that of *N. Jasius*, but similarly furnished with horns on the head and tail. The larva of *N. Fabius*, figured in Gen. Horsfield's collection of drawings in the British Museum, is still more elongated. The larvæ of *Protogonius Hippona*, as represented by Stoll, Supp. Cramer, pl. 2, fig. 1, is subcylindrical, granulose, not spined, slightly attenuated, and apparently simple behind, the head being armed with two short obtuse horns on the hinder part; the larva of *Paphia* is elongated, scabrous and setose, with the head square, and furnished with two small conical horns, which, as well as the sides of the head, are minutely tuberculated. The anal pair of feet are large and divergent. (Stoll, pl. 6, fig. 3, *P. Polycarmes*, and pl. 6, fig. 2, *P. Eribotes*, = *Leonidas*, Cram.) In *Amathusia Phidippus*, as we learn from Dr. Horsfield's invaluable collection of drawings and descriptive Catalogue (pl. 7, fig. 10), the caterpillar is long, with a rounded head, armed on the sides above with a pair of short, broad palmed horns, the body being covered with minute setæ, and also thickly clothed with hairs, especially about the head; the body being terminated by two long setose spines. The larva of *Disco-phora Celinde*, on the contrary, although having the body long, cylindrical, and furnished with hairy tubercles, has the head small and simple, and the tail armed only with two short conical points. (Horsfield, Cat. Lep. E. Ind. Comp. pl. 7, fig. 11.)

According to Madame Merian's figures of the transformations of *Morpho Achilles* and *Telemachus* (the correctness of the former of which has been confirmed by M. Lacordaire), the larvæ are

* See Gen. D. Lep. p. 280, for an account of the transformations of two species of this genus.

long and cylindrical, with several erect spines on each segment, the fore segments being furnished with small tufts of hair; the head bifid on the crown in the latter species, but apparently simple in the former, the tail being forked in both. (Merian, pl. 7 and pl. 68.) How far Madame Merian's figures of the transformations of *Morpho Menelaus*, pl. 53, and *M. Nestor*, pl. 9, be worthy of confidence, is questionable. Dr. Burmeister, indeed, in his excellent revision of M. Merian's plates, says of pl. 9, "Auf dieses Tafel ist alles unrichtig. Die Raupe gehört nicht zu ein Tagvogel, sondern wahrscheinlich zu *Sphinx Vitis*, wenigstens habe ich ähnliche Uebergangskleider bei dieser Art beobachtet; die Puppe ist ganz gewiss die verlassene Hülse eines Ritters, und scheint mir zu *Papilio Polycaon* zu gehören, der später (Tab. 31) mit ganz ähnlicher Hülse und nochmals Tab. 67 mit noch nicht verlassener Puppe verkommt" (Burmeister, Krit. Bemerk. über M. S. Merian, Met. Ins. Surin, p. 4)—whilst of Madame Merian's figures of the transformations of *M. Menelaus* (pl. 53) Burmeister thinks that neither the larva nor pupa is that of a diurnal Lepidopterous insect. Of the transformations of the genus *Caligo*, we know only those of *C. Teucer*, Merian, Ins. Sur. pl. 23, of which Burmeister remarks, "Raupe und Puppe sind zwar nicht besonders gerathen, aber doch kenntlich genug, um sich überzeugen zu können, dass sie wirklich zum Schmetterlinge gehören." The general similarity in form of this caterpillar with that of *Discophora Celinde*, Horsfield, and *Opsiphanes Cassiæ*, Merian, pl. 32, as well also as that represented in Merian's pl. 8 (which she gave as that of *Ageronia Feronia*), proves that in this respect Madame Merian was right, although the caterpillar and chrysalis of *C. Idomeneus* (pl. 60) are so unlike the former, that Burmeister has evident reason to say, that "Die Raupe passt weit eher zu einem Nachtvogel als zu einem Tagvogel," which is moreover fully confirmed by Stoll's figures of *Opsiphanes Berecynthus* and *Cassia*. (Suppl. Cramer, pl. 3, fig. 3 and fig. 4.) The caterpillars of these species in their long bodies, cornuted heads, and long bifid tails, approach certainly to the type of the *Hipparchiidae*, of which the following is the character given in the "Genera of Diurnal *Lepidoptera*."

"Larva attenuated at the extremity of the body, and almost pisciform, tomentose, terminated by two more or less prominent anal points; the head rounded, sometimes emarginate or bifid, or sometimes surmounted by two spines."

But this particular form of caterpillar extends still further, since Dr. Horsfield was fortunately successful in rearing *Melanitis undularis* in Java. This insect belongs to the family *Eury-*

telidæ, and has a caterpillar shorter in proportion than that of *Hipparchia Leda* (figured by Horsfield, pl. 8, fig. 9), and apparently with the body smooth, the head of moderate size, with two erect slender horns, and the tail with two long simple points (Horsfield, pl. 8, fig. 8), whilst the closely-allied *Didonis Biblis* (= *Biblis Thadana*, Godart), for a knowledge of the transformations of which we are indebted to Dr. Boisduval (Crochard's Edit. R. Animal, Ins. pl. 136, fig. 4), has the larva cylindrical, the joints rather constricted, with the anterior segments attenuated; the head armed with two long slender horns, the fourth segment of the body produced above into a conical point, hairy at the tip; each of the other segments produced above into a small slender setigerous lobe, and the tail is apparently simple; the general appearance of the larva is in fact that of a true Nymphalideous butterfly. So also the larva of *Ergolis Coryta*, although belonging to the family of *Eurytelidæ*, has a larva (as we learn likewise from Dr. Horsfield's work, pl. 7, fig. 6) furnished, it is true, with two long spiny horns on the head, but also with a series of setose spines on each segment, so that it closely resembles the larvæ of such Nymphalideous genera as *Epicalia*, *Gynæcia* and *Myscelia* (especially *Myc. Ariadne*, Stoll. Suppl. Cram. pl. 4, fig. 4), and even the larvæ of some of the *fritillaries* figured by Hübner, but in these the two long porrected spines arise not from the head, but from the first segment of the body. Now this revision of the larvæ, with cornuted heads and bifid tails, comprises, I believe, the whole series of butterflies, whose transformations are known up to the present time, which could be assigned to the Thysanuriform type, were we exclusively to build our classification of butterflies upon this single character.

The late Mr. Swainson, in his highly ingenious and often successful views, has made some observations on these larvæ, and the principal variations to be met with among them which appear worthy of being borne in mind. In his latest work (The Natural History and Arrangement of Insects, in Lardner's Cyclopædia, p. 93), he has adopted a family *Satyridæ* (*Hipparchiidæ*, nob.), which he had previously comprised amongst the *Nymphalidæ*, making it include not only the *Hipparchiidæ* of temperate climates, but also the gigantic *Morphidæ* of the tropics, which, on account of the cornuted heads and long bodies, terminated in two processes, either assuming the appearance of tails or of two little short spines of their caterpillars, he thinks, "must of necessity represent the *Gallinacæ* or *Rasores* among birds, and the horned, cattle or ruminants (*Ungulata*) among quadrupeds.* Now both

* It is scarcely necessary to observe, that Mr. Swainson's classifications are entirely founded on the system of representation existing amongst various groups of animals

of these groups of vertebrate animals, in their respective classes, are the only ones which have horns, crests or pointed appendages on their heads. "Look to the whole of the order *Ungulata*, and you will find the rhinoceros, with its horned snout, and the numerous families of deer and antelopes and oxen, all decorated in this manner; turn to the gallinaceous birds, and you will find nearly all the peacocks and pheasants ornamented either with conspicuous crests or with little ear-like egrets, the different fowls with fleshy combs cresting their heads, and the front of the different guinea-hens armed with bony protuberances." So with reference to the analogies resulting from the caudal appendages of these so-called *Thysanuriform* larvæ, "if it be inquired what are the birds which have the greatest development of tail? the merest tyro will name the peacocks, the pheasants, and all the typical gallinaceous birds, as possessing this member in the highest state of development. The analogy of this order of birds with that composed of the domesticated quadrupeds, long ago pointed out by Linnæus, is unquestionable, and we accordingly find that the horse, which stands at their head, has the most beautiful tail among quadrupeds." Again, "it is notorious that the most bulky of true quadrupeds are found in the class *Ungulata*; there we have the elephant, the hippopotamus, and the whole family of antelopes and oxen; the largest birds, on the same principle, occur in the rasorial order, and in like manner the giants of the diurnal butterflies all proceed from the *Thysanuriform* caterpillars" (p. 67). In a subsequent page, he enters into the analogies exhibited by the perfect insects comprising his group of *Satyridæ* (*Hipparchiidsæ* and *Morphidsæ*, nob.), and, in addition to the large size already noticed above, he observes that "the strong peculiarity which runs through all these groups is, that the under surface of the wings is invariably ornamented with beautiful ocellate spots: these spots in the large American species resemble in form, but not in brilliancy of colour, those on the tail of the peacock, but in the European examples they are smaller, more numerous, and often silvery. The general structure of all these insects, even those of the largest, is weak. The typical groups live only in the dark primeval forests, resting on the trunks of trees during the meridian heat, and show a decided partiality for shade; some, indeed, fly only towards the dusk of the evening. These habits, strikingly contrasting with those of the *Papilionidæ* and *Nymphalidæ*, show that we have reached an aberrant group of the Diurnal *Lepidoptera*, and illustrate that general habit and structure must have more weight than partial considerations drawn either from the larva, pupa or the perfect insect."

Ingenious however as these views unquestionably are, and dissatisfied as I have expressed myself to be with the various classifications of the tetrapod butterflies hitherto proposed, I am by no means satisfied of the propriety of regarding the *Hipparchiidae* and *Morphidae* as together constituting one primary section of the Diurnal *Lepidoptera*, the very minute analysis of the genera of which, required for the elaboration of the "*Genera of Diurnal Lepidoptera*," having proved that the great group *Hipparchiidae* is a very characteristic one in itself. Much less am I disposed to follow Dr. Horsfield in admitting such genera as *Apatura*, *Nymphalis*, *Protogonius* and *Paphia* into the section having the *Hipparchiides* as their chief type, on account of the cornuted head and bifid tail of the larvæ, whilst the general structure of the perfect insect is pre-eminently Nymphalideous. Mr. Swainson appears to have been fully alive to the difficulty of this question, attempting to solve it on the principle of variation in groups. The student, he says, must not believe that all the Thysanuriform larvæ, for instance, go into one division. True it is that by such an arrangement he would get a uniformity of the same shaped caterpillars, and he might flatter himself with having discovered the true arrangement of the *Lepidoptera*, but when he looked to the butterflies which proceeded from his Thysanuriform larvæ he would find that so far from exhibiting that regularity and affinity with each other, which, from looking only at their caterpillars, he had expected, he will be perfectly disappointed. He then points out five different instances, in which five different caterpillars, answering to the definition of Thysanuriform larvæ, produce butterflies which belong to the five primary divisions of the *Diurna*, instancing as one of these, which from the length of the horns of the caterpillar might be considered pre-eminently typical, the purple emperor butterfly, which, as indicated above, is given by Dr. Horsfield as one of the primary types of the *Thysanuomorpha*. The principle of variation on which Mr. Swainson endeavoured to explain this apparent difficulty was stated to be, theoretically, as follows: "every natural group of butterflies, either in the caterpillar or perfect state, contains representations of the primary types of larvæ, modified however in such a manner as to indicate the real type to which they actually belong"—hence some Juliform butterflies assume the aspect and character of Scolopendriiform larvæ, others have the Thysanuriform shape, so that, although the butterflies which stand at the head of the Juliform division, as being typical, have Juliform larvæ, "yet that the group, taken as a whole, will contain analogical representations of all the other [four] types of larvæ we have described. The Scolopendriiform butterflies (*Nym-*

phalides) in the very same manner contain also representations of Juliform, Thysanuriform, Vermiform and Anopluriform caterpillars, besides their own proper type, which is Scolopendriiform." In this point of view therefore the purple emperor butterfly is to be regarded as belonging to the *Nymphalidæ*, but as the type of a group of that tribe of butterflies, which represents the Thysanuriform group.

Whether or not these views of Mr. Swainson will ultimately be found true to the extent which he gave to them, it cannot, I think, be doubted that the fixing on a single character, such as that exhibited by the larvæ of any tribe of butterflies, is not sufficient to draw into that tribe every butterfly which may happen to exhibit that character under any extent of development or modification. We may easily imagine modifications in a Nymphalideous larva, which might have for their result the production of a form so much resembling that of a real Thysanuriform larvæ as to lead to an idea that it belonged to the latter primary group; and it needs only to look over the various figures to which I have above referred to be convinced that, although agreeing in one or two characters, such as the cornuted head or bifid tail, they exhibit other and more material differences inter se.

These considerations, which I have detailed rather with the view of showing the difficulties in the present state of the question as to the distribution of the Diurnal *Lepidoptera*, than of attempting to lay down any decided system of classification, will suffice to prove that the *Morphidæ*, although agreeing with the *Hipparchiidæ* in the ocellated markings of the under side of the wings, and in the pisciform character of the larvæ, cannot be associated therewith on account of the more general preponderance of Nymphalideous characters exhibited by the imago. It is true that their large size might, and indeed has been used as a proof of their being the types of the Thysanuriform group; but in my opinion this very fact of their gigantic size is of itself an evidence of aberration from a given type, and would serve rather to convince me that they should be deemed to be aberrant *Nymphalidæ*, approaching towards the *Hipparchiidæ*—if, indeed, the rank of a distinct family should be denied to them. I must, at the same time, confess that I find it next to impossible to draw any (even an artificial) line of separation between the *Morphidæ* and such genera as *Discophora*, *Zeuzidia*, *Amathusia*, *Dyctis* and *Kallima*. Having, however, detailed the characters of these groups in the "Genera of Diurnal *Lepidoptera*," I shall not enter further into the question of their position, and shall now proceed to enumerate the

Eastern species of the three oriental genera, which have been more decidedly regarded as belonging to the family *Morphidæ*, and which agree together (as well as with the South American restricted genus *Morpho*) in having the discoidal cell of the hind wings open and unaccompanied by a small prediscoidal cell, thus differing from *Pavonia*, *Dynastor* and *Opsiphanes*, which have the discoidal cell of the hind wings closed, and accompanied by a small prediscoidal cell,—a character which had not, as far I am aware, been noticed by any previous writer, and which (so far also as I am aware) is found in no other group of butterflies.

Genus **THAUMANTIS**, Hübner, E. Doubleday, Boisduval
(*Morpho*, Godart, Horsfield, Zinken-Sommer).

These insects are the finest representatives of the family occurring in the East, almost vieing, in this respect, with the gigantic *Morphos* of the Western Continent, not only in their large size, but also in the brilliant patches of glossy purple or blue with which some of them are adorned. They are closely allied to *Clerome*, from which they differ in their larger size, more strongly marked colours, and the greater distance apart of the branches of the post-costal vein of the fore wings, which are either partially coalesced with the costal vein, or, if free, are only three in number.

I purposely omit the detailed generic characters of this and the following genera, as they will be found in the "Genera of Diurnal *Lepidoptera*."

The species form two marked divisions:—

1st. Those with four branches to the post-costal vein of the fore wings, two of which coalesce with the costal vein, comprising the type of the genus *Th. Odana* and its allies, and also the fine large species *Th. Aliris*.

2nd. The three species, of large size, which have only three branches to the post-costal branch of the fore wings, all of which are free, namely, *Th. Camadeva*, *Hovqua*, and *Normahal*.

Sp. 1. *Thaumantis Odana*, Godart.

Th. alis omnibus nigro-fuscis; anticis supra fascia lata obliqua disci perpulchre cærulea, nitida medio pallidiori, puncto subapicali albo; subtus strigis disci margineque apicali griseo-seu lilacino-albidis, posticis puncto parvo marginis costalis, ocelloque magno versus angulum analem supra luteo-cincto.
Expans. alarum circ. unc. 4.

Syn. *Morpho Odana*, Godart, Enc. M. ix. p. 445, n. 16; Horsfield, Cat. Lep. Ins. Coll. East Ind. Comp. pl. 6, f. 6 and 5 a; Boisduval, Spec. Gen. Lep. 1, pl. 12 (8 B.), f. 1; Doubl., Westw. and Hewits. Gen. D. Lep., p. 336 (*Thaumantis Odana*).

Thaumantis Oda, Hubner, Samml. Exot. Schmett. Bd. ii. pl. —.

Morpho Klugius, Zinken-Sommer in Nov. Acta, xv. p. 165, pl. 15, f. 12, 13 (male mistaken for female by Z. S.)

Habitat in Java, Singapore, etc.

The costal vein of the fore wings in this species apparently extends into the pale submarginal fascia, emitting two branches to the costa, the first of which is, in fact, the real termination of the costal vein; the second, as well as the apparent termination of the costal, being the extremities of the first and second branches of the subcostal vein, of which the third and fourth branches are free.

The under surface of the wings varies considerably in the intensity of the markings, especially in specimens from Singapore, from whence it has been sent by Mr. Wallace. The male has a patch of hairs at the base of the hind wings on the upper side.

In its colours there is no difference between the sexes of this species.

Sp. 2. *Thaumantis Diores*.

Th. alis omnibus nigro-fuscis, singula supra macula magna disci, perpalchre caerulea, nitida; subtus strigis disci fuscis marginisque externo albidis, posticis ocellis duobus mediocribus supra luteo-marginatis.

Expans. alar. 8 unc. 9 lin.

Syn. *Thaumantis Diores*, E. Doubleday in Ann. of Nat. Hist. xvi. p. 234 (1845); Doubl., Westw. and Hewits., Gen. D. Lep. p. 337.

Habitat Ind. Orient. septentr. Sylhet, Assam.

Above all the wings fuscous black, the anterior with a broad band-like spot, commencing near the costa beyond the middle, and extending towards the anal as far as the lowest median nervule. This spot is of a brilliant metallic changeable blue, much paler and less changeable externally. On the posterior wings is a large patch of the same rich blue, paler in the centre, occupying the whole disc of the wing. Below, all the wings less black than above, the outer margin paler; this pale portion bounded internally by an undulated pale or whitish striga, becoming brown towards its termination at the anal angle of the posterior wings; between

this and the margin is another less distinct similar striga. The anterior wings have besides two fuscous strigæ in the discoidal cell, inclosing a paler space, and a third striga commencing on the costa beyond the cell, and extending obliquely nearly to the anal angle, slightly bordered internally with whitish. The posterior wings have a transverse fuscous striga near the base, and another commencing near the middle of the costa, and reaching nearly to the anal angle. Just within the pale submarginal striga, near the costa, is a round yellowish spot inclosing a brown one, placed towards its outer margin, and between the first and second median nervule a round black spot, sprinkled with blue atoms anteriorly, and surrounded by a yellowish and black iris; anal angle with a geminate spot, composed of black and white atoms; head, thorax and abdomen fuscous. Doubleday, l. c.

The male has a patch of brown hairs capable of erection at the base of the hind wings on the upper surface. The apical angle of the fore wings and the anal angle of the hind wings is much more rounded than in the *Odana*; the body is also much less robust. The branches of the post-costal vein of the fore wings in this species are of the same number and almost identical in their arrangement with those of *Th. Odana*.

Sp. 3. *Thaumantis Ramdeo*, Moore, MSS.

This species, or perhaps more properly local variety, is closely allied to *Th. Diores*, differing from the typical specimens of that species "in being somewhat larger and in having the brilliant blue patch very large (being an inch in diameter either way), and which extends over the whole of the middle of the wings. The under side is paler than in *Diores*, and the wavy line running near the exterior margins of the wings in *Diores*, is nearly obsolete in *Th. Ramdeo*, and the two ocelli on the hind wings are very small."

Habitat Darjeeling, Upper India.

Expansion of the fore wings of the male 4 inches, of the female $4\frac{3}{4}$ inches.

Sp. 4. *Morpho Klugius*, Zinken-Sommer.

Th. alis maris disco atro-cæruleis fulgidis, striga tenui antica albida lineaque undata subapicali pallidiori. Mas.

Expans. alar. antic. unc. $3\frac{1}{2}$.

Syn. *Thaumantis Klugius*, Zinken-Sommer in *Nova Acta*, xv. p. 165, pl. 15, f. 11 (male only); Doubl., Westw. and Hewits., Gen. D. Lep. p. 337.

Habitat in Insula Java.

“Beide Flügel des Mannes sind oben braunschwarz, und mit Ausnahme des Vorder und Hinterrandes, welche matt sind, von dem lebhaftesten schwarzblau schillernden Glanze; übrigens einen kleinen weisslichen Fleck am Vorderrande nahe vor der Spitze ausgenommen, ohne alle weitere Zeichnung. Unten sind alle Flügel dunkel kastanienbraun gefarbt; vor dem Hinterrande beider läuft eine blauweiss bestäubte, inwendig gerade, auswendig klein-gezahnte Binde herum; hinter welcher der Rang braunlich ist. Die Wurzel ist ungleich blauweiss bestäubt, und dadurch hell und dunkel streifig gescheckt. Am Manne sind diese Streifen kaum bemerkbar. Ausserdem zieht noch auf den Vorderflügeln, gerade auf der Stelle wo bei dem Weibe [of *Odana*] oben die blaue Binde liegt, hier bei beiden Geschlechtern eine weiss Binde quer über, welche mit einem gegen die Wurzel gekrümmtem, kleinen Haken auf die vorletzten oder sich endigt; und auf den Hinterflügeln liegen dicht hinter der weisslichen Randbinde zwei am Manne kleinere—schwarze zunächst, mit einem schwefelgelben und dann mit einem schwarzen Ringe umzogene Augenflecke, einer im Vorderwinkel, der andere in einiger Entfernung vom Innenwinkel.”—Zinken-Sommer, l. c.

The male of this species described by Zinken-Sommer was regarded by him as the male of his *Morpho Klugius*, the female of which is the *Th. Odana*. It is however perfectly distinct, and is much nearer to the species next described under the name of *Thaumantis Lucipor*.

Sp. 5. *Thaumantis Lucipor*, Westw.

(Pl. 19, fig. 1, 1 a, male; fig. 2, 2 a, female.)

Mas.—*Th. alis rotundatis supra nigris, apice fuscescentibus disco omnium nitidissime violascenti-cæruleo; alis infra fuscis purpureo parum tinctis; anticis striga oblique recta e medio costæ fere ad angulum analem extensa, parum lilacina; limbo communi pallidiori et e disco striga obscuriori separato; puncto luteo versus apicem marginis costalis posticarum ocelloque parvo pone medium versus angulum analem nigro, semicirculo albo circuloque tenui nigro; antennis ferrugineis.*

Fæm.—*Multo pallidior, colore cæruleo vix ultra medium alarum omnium extenso, fascia tenui obliqua media anticarum subalbida alteraque undata submarginali in alis posticis minus obvia, lut. scent.*

Syn. *Thaumantis Lucipor*, Westw. in Doubl., Westw., and Hewits., Gen. D. Lep. p. 337.

Expans. alarum maris unc. $3\frac{1}{2}$, fœm. unc. 4.

Habitat Borneo (Sarawak), D. Wallace.

In Mus. Brit., Saunders, Wallace.

The male has the wings above black-brown, glossed with intense purple blue, most conspicuous on the anterior pair; at about one-sixth of the length of the wings from the tip is a minute pale dot scarcely visible, the outer margin of the wings from this dot to the anal angle being of an uniform brown colour, the dark glossed part terminating in a series of waves.

The female is of a much paler brown on the upper side, and the blue much less intense in its gloss; it extends also only to about half the length of the wings, being bounded in the fore wings by an oblique whitish line, extending from near the middle of the costa towards the anal angle; near the apical angle are two luteous spots, followed by a waved line, extending to the anal angle; the hind wings with a waved dark brown subapical line, the space within which is rather paler.

On the under side the male has the wings of a dark rich brown and the females of a paler brown. There is an oblique pale bar running across the middle of the wing, recurved at its lower extremity, so that it does not unite with the lower extremity of the wide dark obconical inner boundary of the broad pale apical margin, through which runs a slender dark waved line (almost obliterated in the male); there are also some patches of pale scales (most conspicuous in the female) within the discoidal cell, indicating rudimental fasciæ. The hind wings are also traversed a little before the middle by a nearly straight dark line, edged on its outer margin with pale scales, and which unites near the anal angle with the wide dark obconical inner boundary of the wide pale apical margin, through which also runs a deeply waved dusky line, between which and the dark inner boundary there is a thick sprinkling of pinkish scales. Within this dark boundary line are also two black ocelli, slightly powdered with blue scales above, and surmounted by pale yellow crescents. The basal portion of the hind wings is also powdered with patches of pale scales, indicating several dark rudimental fasciæ.

The four branches of the post-costal vein are arranged nearly as in *Th. Odana* (pl. 19, fig. 1 c), and the male has a double patch of black hairs at the base on the upper side (fig. 1 b).

Sp. 6. *Thaumantis Noureddin*, Westw.

(Pl. 20, fig. 1, 1 ♂, male; fig. 2, 2 ♀, female.)

Mas.—*Th. alis* anticis sub apicem parum angulatis, anguloque anali posticarum in caudam brevem latam subproductis; alis omnibus supra fuscis margine apicali paullo pallidiori, disco omnium purpureo vix tincto, singula posticarum fasciculis duobus pilorum nigrorum instructa; infra castaneo-fuscis, fascia communi submarginali magis castanea, posticis ocellis duobus, magnitudine fere æqualibus, semicirculo albo circumloque nigro circumcinctis.

Fæminæ.—Supra pallidior, tertia parte basali alarum cæruleo-tincta; anticis fascia abbreviata valde obliqua pone medium alarum strigaeque submarginali macularum lutearum; subtus fascia tenui albida obliqua intus, versus angulum analem, recurva et e fascia tenui recta subapicali distincta.

Expans. alarum maris unc. $3\frac{1}{2}$; fæminæ unc. $4\frac{1}{8}$.

Syn. *Thaumantis Noureddin*, Westw., in Gen. Diurn. Lep. p. 337 ♂.

Habitat in Malacca, D. Wallace. India? in Brit. Mus.

The angulated apex of the fore wings, and the produced anal angle of the hind wings, distinguishes this insect from all the other species of the genus. The male has the upper surface of the wings of an intense dark blackish purple, with the outer limb paler brown, a few fulvous scales forming a small spot near the costa at about one-sixth of the length of the wing from its extremity; the hind wing is unspotted.

The upper surface of the wings of the female is much paler than in the male, with a rich but paler blue gloss not extending beyond the basal half of the wing; near the middle of the costa arises a very oblique abbreviated buff fascia, and parallel with the apical margin is a row of small oval dark buff dots; the hind wings are unspotted. On the under side the fore wings in the female are marked by a conspicuous pale buff oblique narrow fascia running from near the middle of the costa towards the anal angle, near which it is waved and recurved, not joining the slender pale buff nearly straight submarginal line; within the discoidal cell are several small patches of luteous scales, obsoletely indicating fasciæ. In the male the central oblique fascia of the female is indicated only by a slightly paler tint in the corresponding part of the wing. The hind wings have a pale slender striga running from within the outer angle to within the anal angle, which is outwardly marked with a pale and a black spot; across

the middle of the wing is a broad slightly darker fascia extending outwardly to the extremity of the discoidal cell.

The branches of the post-costal vein are arranged as in *Th. Lucipor* (pl. 20, fig. 2 b).

Sp. 7. *Thaumantis Aliris*, Westw.

(Pl. 17, upper and under side of the female.)

Th. alis anticis supra fuscis basi magis ferrugineis, fascia obliqua media maculisque duabus subapicalibus albis, posticis fuscis dimidio externo plus minusve fulvis; subtus omnibus basi griseis lituris brunneis, fascia obliqua lata irregulari brunnea, anticis fascia obliqua alba paginæ superioris, linea pallida margine apicali paralella adjecta, posticis ocellis duabus magnis æqualibus pone medium apicibusque late fulvis, Mas et fœm.

Expans. alar. maris circ. unc. 5; fœm. unc. 6½.

Habitat in insulis Borneo et Malacca, D. Wallace. Mas in Mus. Wallace; fœm. in Mus. Hopeiano, Oxoniæ (olim nostr.).

Of this noble species I have only seen a single pair,—the male in the collection of Mr. Wallace, collected by himself in Malacca; and the female now in the Hopeian Collection of the University of Oxford, which I lately obtained at a sale by auction at Mr. Stevens's Rooms. It is the female which is represented in plate 17. The male is considerably smaller, with the oblique fascia of the upper side of the fore wings about half the width of that of the female, and with two white spots near the tip of the fore wings, which are considerably suffused with ferruginous at the base; such is also the colour of the base of the hind wings, which is gradually shaded off to a rich fulvous colour; there is, however, a broad dark longitudinal patch extending to the outer margin of the wing, occupying the space between the second and third branches of the post-costal vein. On the under side the markings agree in the two sexes, except that the oblique bar of the fore wings is even rather narrower than on the upper side, and the great ocelli are also much less conspicuous than in the female. The middle of both fore and hind wings is occupied with a broad irregular chocolate-ferruginous bar. The post-costal vein of the fore wings emits four branches. The first branch arises at some distance before the extremity of the discoidal cell, and joins the costal vein before the juncture of the latter with the costa, being again emitted from below the extremity of the costal

vein, and after running a short distance joining the costa; the base of the second branch of the post-costal vein forms a short transverse veinlet between the end of the costal vein and the end of the first branch of the post-costal, its extremity being again emitted from the end of the first branch and uniting with the costa at a short distance beyond it; the third and fourth branches of the post-costal vein are free. The structure is, in fact, identical with that of the veins in *Th. Lucipor*, male, represented in plate 19, fig. 1 c, except that the lower disco-cellular connecting veinlet forms a much stronger arch towards the base of the wing. In the female, the second branch of the post-costal vein (plate 17, fig. 2 b) slightly coalesces with the outer portion of the first branch, 2 a, (more closely, indeed, than is represented in the space between the † and the letters 2 a,) thus proving most satisfactorily the real nature of these apparently supplemental branches of the costal vein.

This beautiful species is dedicated to Aliris, the youthful poet-king of Bucharria, whose love for Lalla Rookh, under his minstrel name of Feramorz, has been so charmingly told by one of the most delicious of modern poets.

Sp. 8. *Thaumantis Camadeva*, Westw.

Th. alis anticis supra albis, plumbeo-cæruleo tinctis, basi brunneis, fascia submarginali macularum alteraque lunularum fuscis; alis posticis fuscis, basi brunneis, fascia lunularum plumbeo-albarum pone medium; alis infra basi albidis, apicibus fulvis, fascia lata communi fulva utrinque linea nigra cincta ante medium alarum ocellisque 5 (in singula ala) rubris iride nigra, pone medium strigisque duabus submarginalibus pallide fuscis.

Expans. alar. antic. unc. 4½.

Syn. *Morpho (Thaumantis) Camadeva*, Westw., Cab. of Orient. Entomol. p. 9, pl. 4, f. 12; Doubl., Westw. and Hewits., Gen. D. Lep. pl. 55, f. 2, p. 337.

Habitat Himalaya, Sylhet.

In Mus. Brit., Hop. (Oxon. olim nostr.), &c.

This beautiful species, from its exquisite beauty, is dedicated to the Indian God of Love—Camadeva. (See Sir Wm. Jones.)

The general appearance of the two sexes is nearly identical. The male has a tuft of hairs at the base of the hind wings on the upper side. The post-costal vein has only three branches; the first arising before the extremity of the discoidal cell; the second

rather before the junction of the first branch with the costa; and the third slightly in advance of the row of ocelli; the terminal part of the post-costal vein being more oblique than usual.

Sp. 9. *Thaumantis Howqua*, Westw.

(Pl. 18, fig. 2, 2 a.)

Th. alis supra fulvis, omnium serie subapicali lunularum nigrarum valde curvata, maculis hastiformibus nigris, in alis posticis majoribus, antice adjectis; alis infra luteo-fulvis, strigis duabus obliquis irregulariter sinuatis, 1ma ante et 2nda pone medium alarum anticarum, et ante et per medium posticarum extensis, externa e costa fere ad angulum analem ducta ubi recurvata; nubila recta obliqua fusca submedia ad angulum analem extensa, macula grisea terminata; alis anticis ocellis tribus, posticis quinque rufis, pupilla alba iride tenui nigra strigisque duabus parallelis vix angulatis prope marginem apicalem. (Mas et fœm.)

Expans. alar. antic. unc. 5.

Habitat Shanghai, China. (D. Fortune.)

In Mus. Britann., Hop. Oxon., &c.

Syn. *Thaumantis Howqua*, Westw. in Trans. Ent. Soc.

Like the *Camadeva*, this insect has only three branches to the post-costal vein of the fore wings (pl. 18, fig. 2 a, 2 b, 2 c). The sexes also agree in their general appearance.

Sp. 10. *Thaumantis Nourmahal*, Westw.

(Pl. 18, fig. 1, 1 a, female.)

Th. alis supra castaneo-fuscis, anticis fascia latissima fulva obliqua, pone medium ad marginem et angulum analem extensa, serie communi submarginali literarum V fuscaram, alteraque lunularum ejusdem coloris, puncto albo subapicali anticarum: alis infra badio-fulvis, fasciis duabus angustis fere rectis virescenti-argenteis obliquis, 1ma per medium cellulæ discoidalis extensa, 2nda fere e medio costæ ad angulum analem currente, singula intus linea nigra marginata; margine externo lato pallidiori, in quo ocelli 2 ferrugineo-fulvi in alis anticis, 3 in posticis, singulo puncto medio lunulari albo notato; lineis duabus valde flexuosis et dentatis nigris submarginalibus maculaque nigra lilacino parum irrorata in angulo anali. (Fœm.)

Syn. *Thaumantis Nourmahal*, Westw. in Doubl., Westw. and Hewits., Gen. Diurn. Lep. p. 337.

Expans. alar. maris unc. $3\frac{1}{2}$; fœm. unc. $4\frac{1}{4}$.

Habitatin India Orientali.

In Mus. East Ind. Comp., Saunders et Mus. Brit.

The description published by me in the "Genera of Diurnal *Lepidoptera*," was made from a female at that time unique in the collection of W. W. Saunders, Esq., F.R.S., President of our Society. The East India Company has, however, subsequently received both sexes from India. The male differs from the female, as I am informed by Mr. F. Moore, merely in wanting the white subapical spot near the extremity of the fore wings.

On the upper side the wings are of a rich chesnut brown colour, the fore ones having a very broad oblique fulvous fascia, extending from the costa to the apical margin and anal angle; the tip of the wings being dark brown, with a small white subapical spot in the female. There is also a series of submarginal brown V-shaped marks, and another of brown lunules in all the wings. Beneath the colour is paler, with a broad oblique subcentral fascia, edged with a slender black slightly irregular line on each side, the one nearest the base being internally, and the outer one externally edged with a line of pale silvery greyish green scales. The discoidal cell in the fore wings is closed by black veins, but in the hind wings the outer black striga forms its termination. The fore wings have also five ocelli, and the hind ones three, in the alternate spaces between the veins, the intervening spaces being marked by paler dots, indicating obsolete ocelli. Near the apex of the wings are two slender dentated black lines, ending at the anal angle in a black dot, slightly suffused with lilac scales.

As in the two preceding species, the fore wings have only three branches, arising from the post-costal vein of the fore wings. (Pl. 18, fig. 2 a, 2 b, 2 c.)

The charming play of colour on the underside of the wings of this species has suggested the specific name of *Nourmahal*, "The Light of the Harem" of Jehanguire, renowned for

" Loveliness, ever in motion, which plays

Like the light upon Autumn's soft shadowy days :

Now here and now there giving warmth as it flies,

Now melting in mist and now breaking in gleams."—*Moore's Lalla Rookh*.

Genus DRUSILLA, Swainson.

Hyades, Boisduval.

Morpho, p., Zinken-Sommer.

Tenares, Hübner (Verzeichniss.)

These insects differ chiefly from *Thaumantis* in the more elongated form of the fore wings; the existence of four free branches of the post-costal vein of the fore wings, the second, third, and fourth of which arise far beyond the extremity of the discoidal cell; the very large and striking eye-like spots with which the hind wings are ornamented; and the general dull colouring of the insects.

Sp. 1. *Drusilla Urania*, Linn.

Alis oblongis integerrimis fusciscentibus, disco plus minusve albidis seu albis, posticis ocellis utrinque binis externo supra fere obsoleto.

Expans. alar. antic. circ. unc. 4 $\frac{3}{4}$.

Syn. *Papilio Urania*, Linnæus, Syst. Nat. Ed. x. p. 446, No. 48; Mus. Lud. Ulr. p. 225; Syst. Nat. ii. p. 756; Fabricius, Ent. Syst. iii. pt. 1, p. 166, No. 512. -

Papilio Jairus, Fabricius, Gen. Ins. Mant. p. 258; Ent. Syst. iii. pt. 1, p. 54, No. 168; Cramer, Pap. pl. 6, fig. A. B., pl. 185, fig. A. B. C.; Godart, Enc. M. ix. p. 445 (*Morpho J.*); Boisduval, Voy. de l'Astrolabe, Entomol. pt. 1, p. 157; Donovan, Ins. of China, pl. 33, fig. 1, 2.

Oreas dubia Jaira, Hübner, Samml. Ex. Schm. Bd. pl.

Tenaris Nysa, Hübner, Verz. bek. Schm. n. 493.

Papilio Cassiæ, Clerck, Icones, f. 29, f. 3.

Habitat in Amboyna, Rawak, New Guinea.

The following is the Linnæan definition published in the Museum Regiæ Ludovicæ Ulricæ.

Papilio alis oblongis integerrimis fusciscentibus disco albis, posticis ocellis utrinque binis. Corpus secundæ magnitudinis. Alæ primores utrinque fuscæ, discus albidus immaculatus. Alæ posticæ utrinque fuscæ disco albedo, ocelli 2 grandes flavi iride nigro cærulescente cincti nigredine, pupilla alba minima; horum alter ad marginem anteriorem, alter vero fere in disci medio.

Fabricius simply took up the species *Urania* from the writings of Linnæus as above referred to, placing it among his *Heliconii*, not being aware of its identity with his *Papilio Jairus*, which he had placed among his *Festivi*, with the following description:

“Magnus. Alæ omnes integerrimæ fuscæ, anticis fascia fere obsoleta, posticis disco albidis. Ocellus magnus cœruleus, iride flava pupillaque alba alarum posticarum et subtus duo ejusdem coloris, quorum posteriori interdum ocellis minor pupillatus adnatus.”

There is considerable diversity in the pale shade of the fascia of the fore wings, and hence Clerk's figure has a much greater extent of white than Donovan's or Cramer's. Cramer's figure also in his plate 6 exhibits a variety with a minute ocellus, joining to the large discoidal one as described by Fabricius.

Sp. 2. *Drusilla Horsfieldii*, Swains.

Alis anticis elongatis fuscescentibus, margine interno sinuato; posticis interne albis, supra ocello unico, subtus duobus, mediocribus.

Expans. alar. fere unc. $3\frac{1}{2}$.

Syn. *Drusilla Horsfieldii*, Swainson, Zool. Illustr. 1st Series, t. 11; Doubl., Westw. and Hewits. Gen. D. Lep. pl. 54, f. 4, p. 335.

Hyades Horsfieldii, Boisduval, Spec. Gen. Ins. Lep. pl. 13 (9 B.), f. 1.

Morpho Urania, Zinken-Sommer in Nova Acta, xv. p. 167, nec Linnæus.

Habitat in Insula Java.

Sp. 3. *Drusilla Catops*, Boisd.

D. alis albis, anticarum costa apiceque late fuscis, posticis albis basi pallide fulvescenti, angulo externo fusco ocellisque duobus paginæ inferæ supra parum distinctis.

Hyades Catops, Boisd. MS.

Drusilla Catops, Doubl., Westw. and Hewits, Gen. D. Lep. p. 335.

Habitat New Ireland.

Sp. 4. *Drusilla Selene*, Boisd.

D. Urania major et multo pallidior; alis anticis fœminæ albo magis distincto, ocellisque posticarum maximis et supra distinctis.

Hyades Selene, Boisd., MS.

Drusilla Selene, Doubl., Westw. and Hewits., Gen. D. Lep. p. 335.

Habitat New Guinea.

Sp. 5. *Drusilla Phorcas*, Westw.

(Pl. 21, fig. 1.)

D. alis rotundato-oblongis integerrimis fuscis, omnibus plaga magna subovali alba ex angulo anali ultra ramos venæ discoidalis extensa, posticis supra ocello unico, subtus duobus; externo lunula pallida supra instructo.

Expans. alar. antic. unc. $4\frac{1}{2}$.

Habitat ———? Dom. McGillivray. In Mus. Britann.

On the upper side the hind wings have the outer angle wholly brown, without any trace of the ocellus; the white patch is rather larger and the outer brown ring of the anal ocellus is replaced by a very few brown scales.

Beneath, the white patch of the fore wings extends into the space between the third branch of the discoidal vein and the lower disco-cellular: such is also the case with the patch on the hind wings; but in these wings it is united with a white lunule surmounting the outer ocellus.

The palpi are fulvous.

Sp. 6. *Drusilla Mylæcha*, Westw.

D. alis niveis, omnium utrinque costa nigricanti, posticis subtus ocellis duobus magnis æqualibus nigris pupilla minima alba circulo latiori fulvo alteroque tenui nigro circumcinctis, capite thoraceque subtus nigris, palpis fulvis, abdomine lutescenti (mas et fœm.)

Expans. alar. antic. unc. 4.

Habitat in Insulis Louissiadis maris Indici (*D. M'Gillivray*).

In Mus. Britann.

D. Mylæcha, Westw., in *Trans. Ent. Soc.*, vol. 1, n. 5, p. 175; White in *McGillivray's Travels*, pl. 4, figs. 3, 4.

Genus CLEROME, Boisduval, MS.

Faunis, p., Hübner.

Satyrus, p., Godart.

This is a genus of very plain-looking butterflies, which, although united by Hübner and Godart with the *Hipparchiidae*, are most nearly allied to *Drusilla*, agreeing therewith not only in the general arrangement of the wing veins, (there being four free branches of the post-costal vein of the fore wings,) but differing in the shorter and more rounded wings, and in the more or less distinct strigæ on the under side. They are of comparatively small size, and have much the appearance of species of *Hipparchiidae*.

Two curious species, differing considerably from the types of

the genus which have been sent from the Eastern islands by Mr. Wallace, are described below, as forming distinct subgenera.

Sp. 1. *Clerome Arcesilaus*, Fabricius.

Cl. alis integris supra fusco-ochraceis, immaculatis, subtus fuscis, seu umbrino-fuscis, omnibus strigis tribus obscuribus (prima interdum subobsoleta), serieque punctorum flavorum.

Expans. alar. antic. unc. $2\frac{1}{2}$ — $2\frac{3}{4}$.

Habitat Siam, Java, Malacca, India, Sylhet.

Papilio (N.), *Arcesilaus*, Fabricius, Ent. Syst. iii. 1, p. 153, No. 470; Donovan's Ins. of India, pl. 30, fig. 2, Edit. Westw. p. 45 (*Hipparchia*? *Arc.*); Doubl., Westw. and Hew. Gen. Diurn. Lep. pl. 54*, fig. 5 (*Clerome Arc.*); Latreille et Godart, Enc. Méth. 9, p. 497; (nec *Pap. Arcesilaus*, Cramer, pl. 294.)

Faunis Canens, Hübner, Samml. Exot. Schm. v. 2, pl. 294.

Morpho Leonteus, Zinken in Nova Acta C. L. C. Nat. Curios. vol. xv. pt. 1, p. 170, pl. xvi. fig. 14, 15.

The uniform colour of the upper side of the wings, united to the minute and uniform size of the row of pale dots on the under side, will suffice to distinguish this species from *Cl. Eumeus*. Fabricius is silent as to the row of minute pale dots, but they are represented in Donovan's figure, as well as the sub-basal dark striga.

Faunis Canens, Hübner, agrees entirely with *Morpho Leonteus* of Zinken; the two outer strigæ of the underside being not very distinctly indicated, while the middle one is more suffused; the pale dot being very minute.

Specimens sent from Malacca by Mr. Wallace (about $2\frac{1}{2}$ inches in expanse) differ in the richer red-brown colour of the upper side of the wings, and in having the outer dark strigæ obsolete on the fore wings.

A specimen from Singapore, in the British Museum, about $2\frac{3}{4}$ inches in expanse, does not differ from Javanese individuals in the same collection; whilst specimens from India and Sylhet, in the same collection, and of the same size, have the upper surface richer and redder fulvous than the Java specimens, and on the underside the middle striga is more distinct, and much more angulated, and the row of white dots small.

Sp. 2. *Clerome Eumeus*, Drury.

Cl. alis integris rufo-fuscis, anticis utrinque fascia lata obliqua

fulva (apice ipso fusco), omnibus subtus strigis tribus sub-æquidistantibus, gracilibus obscuris serieque communi punctorum alborum, pone medium alarum, magnitudine et numero irregularibus.

Expana. alar. antic. circ. unc. 3.

Habitat China (Drury); India (Mus. Hunter, teste Fabr.)

Syn. *Papilio* (*Dan. Festiv.*) *Eumeus*, Drury, Exot. Ins. vol. i. pl. 2, f. 3, and vol. 2, App. (1773); ditto, Edit. Westw. vol. 1, p. 5. (*Hipparchia Eum.*)

Papilio Eumea, Cramer, ii. p. 132, pl. 183, fig. c. D. (1779).

Papilio (*Nymph.*) *Gripus*, Fabricius, Ent. Syst. iii. 1, 149, No. 457; Latreille et Godart, Enc. Méth. ix. p. 497, No. 70.

An old specimen in the Hopeian Collection, purchased from that of Mr. Haworth,—by whom the attached label, with the locality “China,” was written,—was, I have no doubt, one of the individuals described by Drury, with seven spots on each of the hind wings, Drury’s figure representing a specimen with five spots on each of the four wings; his description, however, indicates the variation of five or seven spots.

Drury’s figure does not represent the sub-basal dark striga, which is, indeed, almost obsolete on the fore wings, nor does he represent the strigæ on the hind wings.

Cramer’s insect from China is evidently identical with Drury’s, although there is a difference in the intensity of the strigæ, of which the subbasal one is also not represented by Cramer.

Fabricius described the species from the collection of Dr. Hunter, and as a native of India. His description accords with Drury’s figure. He describes the spots on the underside of the hind wings as larger than those of the fore wings.

In the British Museum collection is a specimen from Hong Kong $2\frac{1}{2}$ inches in expanse, rich brown above, with the oblique fulvous subapical fascia of the fore wings more oblique, and with the strigæ of the hind wings nearly obsolete except the middle one of the hind wings, and the spots are round, large, and whitish.

Larger specimens from Assam, and another from India, in the Hopeian Collection at Oxford, and the British Museum, measure four inches in expanse, and have the broad, oblique, fulvous fascia of the fore wings but ill-defined, and gradually shaded off to the darker ground colour of the wings. The three strigæ of the underside are distinct: the outer one more angulated: the white spots are of unequal size: the fifth in the fore wings, and the first

in the hind wings, being the largest. If these large specimens should prove to be more than a geographical variety, they may be termed *Clerome Assama*, Westw.

Their right, however, to this distinction, and even the distinction between this species and *Cl. Arcesilaus*, is rendered doubtful by a specimen from Northern India, measuring $3\frac{1}{2}$ inches in expanse, having the wings above of an uniform fulvous brown colour, whilst on the under side they are similar to the above described individuals from Northern India.

Sp. 3. *Clerome Phaon*, Erichson.

Cl. alis integerrimis rotundatis supra ochraceo-fuscis immaculatis, subtus umbrinis, inferioribus ocellis duobus magnis.

Expans. alar. antic. unc. 3.

Habitat in Insulis Luçon (Manillarum) et Borneo.

Syn. *Drusilla Phaon*, Erichson in Nova Acta Acad. C. L. C. Nat. Curios. vol. xvi. suppl. tab. XL. (L.), fig. 1 and 2 a, p. 279 (401); Doubl., Westw. and Hewitson, Gen. D. Lep. p. 337 (*Morpho Ph.*)

The figures given by Dr. Erichson exhibit, in addition to the two large ocelli on the disc of the hind wings, a slender dark curved line across all the wings at about one-fourth of the length of the wing from the base; a second similar striga across the middle of the wings; a minute pale dot near the extremity of the fore wings, and two fine slightly waved lines parallel to the outer margin.

The two large ocelli on the under side of the hind wings at once distinguishes this species from the preceding; whilst it gives it a similarity to the typical species of *Drusilla*.

Mr. Wallace has sent a very small specimen from Singapore, measuring not quite two inches in the expanse of the fore wings, having the wings on the upper side of a rich reddish brown-ochre colour, the under side being nearly identical, with the three strigæ distinct; the sub-basal one rather undulated, the middle one simply curved, and the outer one at a short distance from the outer margin and much angulated. The ocelli have a row of small dots; the first, second, fourth, and fifth are simply minute white specks; the third encircled with a small black ring, whilst the sixth is a small ocellus. The spots on the hind wing are similar to those in *Cl. Stomphax*, three minute white ones being interposed between the two ocelli, which are not so large as in the Manilla specimens. It will, doubtless, be considered that this individual

is a local variety of *Cl. Phaon*, and not a distinct species. A male specimen of *Cl. Phaon*, from Borneo, in the Collection of the East India Company, measures two and a-half inches, and a female measures three inches in expanse; the fore wings beneath have three minute white dots near the apex, and the hind wings have two large ocelli, that on the anal angle being the largest, the outer circle being dull yellow, with three minute white dots between the ocelli.

Sp. 4. *Clerome Stomphax*, Westw.

(Plate 21, figs. 3 and 4.)

Cl. alis integerrimis margine antico anticarum valde rotundato, supra fusco-ochraceis, extus paullo obscurioribus; infra fuscis, anticis striola tenuissima angulata obscura subbasali, fascia angusta alba obliqua pone medium, guttisque tribus luteis subapicalibus; posticis striolis tribus tenuibus fuscis æquidistantibus, ocellis duobus punctisque tribus luteis intermediis.

Expans. alar. antic. unc. $2\frac{1}{2}$.

Habitat in Borneo, Sarawak. D. Wallace. In Mus. Hewitson and Saunders.

The white oblique fascia on the under side of the fore wings at once distinguishes this insect from *Cl. Phaon*. The specimen represented is a male.

Sp. 5. *Clerome (Melanocyma) Faunula*, Westw.

(Plate 21, fig. 2.)

Cl. alis anticis supra pallide-fuscis, posticis albidis, harum dimidio interno fulvo, omnibus subhyalinis, strigis paginæ inferioris supra indistincte apparentibus in alis posticis, alis subtus albis, dimidio interno posticarum fulvo, strigis 4 undulatis nigris. Fœm.

Expans. alar. antic. unc. $3\frac{3}{4}$.

Habitat Singapore; Mount Ophir, Malacca. D. Wallace. In Mus. Brit. et Wallace.

Thaumantis Faunula, Westwood in Gen. Diurn. Lep. p. 334, pl. 54, f. 1.

In the "Genera of Diurnal *Lepidoptera*" I arranged this singular insect in the genus *Thaumantis*. The arrangement of the branches of the veins of the fore wings is however unlike that of any of the species of that genus, agreeing in the circumstance of the second branch of the post-costal vein of the fore wings arising far beyond the extremity of the discoidal cell, as well as in the shortness of

the wings, with *Clerome*, in which latter respect also it differs from *Drusilla*. The fact however of its being entirely destitute of ocelli is perhaps of sufficient importance to warrant its sub-generic separation, in which case it may receive the name of *Melanocyma*. Mr. Hewitson having represented the upper surface of the insect on plate 54 of the "Genera of Diurnal *Lepidoptera*," the far more striking under surface is here only figured. The second branch of the post-costal vein of the fore wings, arises at about three-fourths of the length of the wings from the base opposite to the junction of the costal vein with the costa, and the fourth branch opposite to the junction of the extremity of the first branch with the costa. The lower disco-cellular vein closing the discoidal cell is singularly angulated, and the costal vein of the hind wings only extends to the middle of the costal margin. Another peculiarity of the species consists in the slight clothing of the wings, which enables the black undulated markings of the under surface to be partially seen from above.

The upper side of the fore wings is a pale brown, the lower ones being buff, with the inner half of a rich fulvous colour. Beneath the fore wings are still paler, being of a dirty white, the inner half of the hind wings more richly fulvous, the black bars form four irregular fasciæ independently of the submarginal line, which is dilated in the middle of the hind wings. The specimen in Mr. Wallace's collection which I have examined is a female.

Sp. 6. *Clerome (Xanthotænia) Busiris*, Westw.

Cl. alis supra castaneo-fuscis, anticarum dimidio apicali fusco, fascia recta obliqua flava punctoque subapicali albo; alis subtus pallidioribus; posticis strigis 4 valde undatis fuscis ocellisque 8 magnitudine irregularibus.

Expans. alar. antic. unc. 3.

Habitat in Malacca. D. Wallace. In Mus. Britann. et Wallace.

In the shortness and roundness of the fore wings, and in the upper surface being destitute of ocelli, this insect agrees with the genus *Clerome*, but differs in the broad oblique yellow fascia and subapical white spot of the fore wings, as well as the more elongated form of the hind wings and the insertion of the second branch of the subcostal vein at a short distance beyond the extremity of the discoidal cell, (opposite to the extremity of the costal vein, which only reaches to the middle of the costa,) the third and fourth branches of the post-costal vein of the fore wings rise a moderate

distance apart; the lower disco-cellular vein of the fore wings (closing the discoidal cell), although oblique, is nearly straight. The palpi are much compressed, of moderate size, thickly clothed with close adpressed hairs, the terminal joint distinct, slender, acute at the tip, and raised to the level of the top of the crown of the head. The antennæ are long, gradually but slightly clavate, the tip a little curved and acute; they are brown, the outer half ferruginous. From all these characters I have no hesitation in regarding this insect as a distinct subgenus, to which I have applied the name of *Xanthotænia*, in allusion to the yellow fascia of the fore wings. The general colour of the wings above is rich but dull chestnut-brown; the hind wings immaculate; the fore ones with the outer half dark brown, with a moderately broad, nearly straight yellow fascia, extending from the middle of the costa nearly to the outer margin (below the middle), and with a sub-apical white dot. Beneath the wings are pale brown (without any chestnut tinge), the hind wings with four deeply scalloped, slender brown strigæ, the space between the second and third being the widest, inclosing eight ocelli of unequal size, the second and sixth from the costa being the largest; they are thickly powdered with grey scales, and are surrounded by a very narrow yellow ring: the space between the third and fourth strigæ is paler than the rest of the wing, and between the first and second strigæ is a short transverse dark line, being the vein closing the discoidal cell. In the fore wings the discoidal cell is marked in the middle with a very strong angulated brown slender line, and between the white subapical dot and the extremity of the yellow oblique fascia are two small nearly rudimental ocelli similar to those of the hind wings.

I here take the opportunity of adding a figure and description of a striking species of the genus *Discophora*, of which short characters were published in the "Genera of Diurnal *Lepidoptera*."

Discophora Zal, Westw.

(Plate 21, figs. 5 and 6.)

D. alis anticis apice subfalcatis; posticis in medio marginis postici anguloque anali angulatis; supra fulvis, anticarum costa pallida, dimidioque apicali fusco triplici serie macularum, serie interna alba, alis fulvis; posticis fulvis triplici serie lunularum fuscarum nubilaque submarginali fusca:

alis subtus luteo-albidis striga tenui punctisque prope basin fuscis, fascia parum distincta media obscuriori; ocellisque duobus minimis pone medium notatis.

Expans. alar. antic. unc. 3½.

Habitat in India Orientali. In Mus. Brit. et Saunders.

This species is remarkable for the somewhat falcate form of the fore wings, and the angulated hind wings; the white colour also of the innermost row of spots on the fore wings is characteristic. In this pair of wings the ground colour is brown, the spots being pale-coloured, but in the hind wings the spots are so much increased in size as to constitute the ground colour of the wings, reducing the separating dark parts to rows of obscure lunules. The oblique vein which closes the discoidal cell is curved at its base, and marked by a dark brown spot, with a dark dot beneath it. There is also a corresponding dark dot on the discoidal cell of the hind wings, which is not closed by a discocellular transverse vein. The four branches of the post-costal vein are arranged nearly as in *Thaumantis Lucipor*; the first and second of these branches coalescing with the costal, but separated from it beyond its extremity. The antennæ are short, straight, and but slightly clavate.

The very pale buff colour of the under side of the wings, with the markings nearly obsolete, is also very characteristic.









