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_____ VOLUME V: _____

THE MACROLEPIDOPTERA

of the

AMERICAN FAUNISTIC REGION



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Introduction.

The giant continent of America, which extends from the eternal snows of the arctic polar region further south than any other continent, is better adapted than any other to the production of an inexhaustible wealth of the most varied animal forms. Open almost everywhere to the moisture-laden east winds from the Atlantic, it admits the fertilising rains far into the interior, and thus develops an extensive and finely branched network of watercourses, which, in conjunction with the varying conditions of climate and warmth in the successive zones, call into being a fauna of quite unique variety.

Originating from the circumpolar arctic fauna, the entire fauna from southern Canada to Texas acquires a character approaching that of Europe and central Asia. Not only that the dominant animal forms in temperate North America belong, for the most part, to groups which also play a principal rôle in the temperate zone of the Old World, the geographical distribution shows also here the most striking analogies. Among the Lepidoptera, Argynnis, Melitaea, Vanessa, Apatura, Arctiids and Catocalas figure prominently in both, and as a single outstanding difference, the preponderance of the Hesperids in America, as against the prevalence of Satyrids in the Old World, is manifest even on superficial consideration. But the sum total of the forms to be observed in the northern temperate zone is almost equal in both hemispheres, while one half of the eastern temperate lands — corresponding roughly to the whole of the western — contains about the same number of Lepidoptera as that, namely about 6500 forms.

This is changed as soon as we reach the tropical zone in America. Quite suddenly all resemblance to the fauna of the Old World vanishes. The singular and highly characteristic *Morpho, Ithomia, Melinaea* and *Heliconius, Castnia* and *Glaucopis, Pericopis* and *Cyllopoda*, the wonderful forms of neotropical Erycinids the tailed Hesperids. etc., have no counterparts in the Old World. They give to the South American fauna such a distinct individuality, even compared with that of the cooler parts of North America (north of Mexico), that the lepidopterous fauna of South America may well be designated the most characteristic of the world. What its principal pecularities are, has already been pointed out in the introduction to this work, and will be further considered below.

That in spite of all this we have decided not to separate the North from the South American fauna, as has hitherto been done in zoogeography, under the terms Neotropical and Nearctic, is due to the fact that a basis for any sharp delimitation is wanting here, as it is between the Indian and Australian faunistic regions. Just as the limits there drawn by WALLACE are arbitrary, so also in America the otherwise applicable principle of faunistic division fails us. Let us, for example, compare the conditions in America with those of the much more compact continent of Africa: south of the Sahara there is no species of *Euchloë*, no *Aporia*, no *Procris*, no true Zyguena, no Vanessa, no Pararge, no Ocnogyna, in short all the species are absent which in North Africa are the commonest, not to say the most obtrusive representatives of the butterfly world. On the other hand the north has no *Euphaedra*, no *Cymothoe* or *Euryphene*, all the groups of *Papilio* and Pierids which are distributed throughout the rest of Africa are wanting, we seek in vain for Amauris, which is so characteristic of the whole of tropical Africa, and so on.

In America there is no such insuperable barrier as is formed by the great Sahara desert of Africa, with its absence of vegetation. Thus we find the otherwise purely South American Neotropids pushing northwards into California, the genus *Heliconius* into Florida, while *Argymus, Colias, Catocala*, etc., extend their range southwards on the heights of the Andes; in a word, the two faunas so encroach upon one another that we prefer to draw no boundary at all rather than an artificial one; and we do this so much the more willingly because these theoretical considerations fit in with a series of practical ones.

Among the characteristics of the lepidopterous fauna of America, which are most prominent in South America, we would mention its **richness in species**. It used to be said that the double continent of America alone contained about as many species as all the rest of the world. This comparison was applicable so long as we had not learned to distinguish all the numerous local forms of certain Malayan and Indo-Chinese butterflies, which result in the appearance of a single species, on all those larger and smaller islands of the Malay Archipelago, in a dress similar, yet with constant differences according to the locality. But since the species of the Old World have been split up into such a large number of races or local varieties, or subspecies, rainy- and dry-season forms, mountain forms and those of the lowlands, the more compact South America, being for the most part more regularly tempered, without pronounced rainy season, has lost very much of its preeminence.

Now when one takes into consideration that any butterfly, of whatever species, would be able to fly from Canada as far as to Cape Horn without meeting with any direct, insurmountable obstacle — neither such a sharply defined desert as separates Northern from Central and Southern Africa, nor a sea, as between Australia and India — it is not easy to understand how it is that we find Castnias, Neotropids, Hesperids or Catagrammas in almost every district of America in distinct forms, mostly unconnected with one another by transitions. In this is manifest a creative energy of unusual richness, such as occurs in no other country to the same extent.

The lavish endowment of its species with brilliant and conspicuous colours is the second principal characteristic of the American fauna. In India and tropical Africa there are also plenty of gay species, which fact we do not leave out of account; but while the Old World everywhere produces, side by side with the gay and richly ornamented forms, multitudes of others which are tawny, white or neutral brown in colour, many of the open places in the South American woods are alive with the little gold- and silver-marked Syntomids or the azure blue giant butterflies. None of the Old World species can vie with Argopteron anreipennis in its pure golden under surface, or show such rich adornment of silver as Dione moneta, or such brilliant blue ground colour as Morpho cypris. And even those colours which have not the metallic or silky gloss are nevertheless extremely elegant and pleasing in their arrangement. Very frequently they consist of bright red, orange or blue-green bands or longitudinal spots on a deep black ground, resulting in more quiet richness and fulness of colour than a stiffer, more overloaded scheme of markings. Such crude contrasts of colour as occur in the Papilio aganemnon group, in Neurosigma and in Catphisus, are rare in America. A deeply coloured, though almost always only unicolorous band suffices to make Epicalia, Chlorippe and Prepona, Callicore and Adelpha the most beautiful forms which a refined taste could imagine.

The phenomenon of mimicry, which was fully discussed in the introduction to the first part of this work, appears in America in an altogether special and characteristically modified manner. There are many localities in South America, often quite circumscribed in extent, in which almost all the lepidopterous species that occur in any numbers have one and the same wing-pattern indifferently, whether they be butterflies or moths, whether stoutly-built Swallowtails or weak Pierids or shy Nymphalids. In Colombia one may see flying about a single flowering shrub a number of butterflies all coloured and marked alike, but belonging to four entirely different groups. They are all black with an oblique scarlet band on the forewings. The first is a Pierid (*Pereute leucodrosyme*), the second a Heliconius (*Heliconius melponene*), the third a Swallowtail (*Papilio euterpinus*) and the fourth (*Adelpha isis*) a species of Nymphalid allied to *Limenitis*. In certain districts of Southern Brazil a yellow band on the forewing and dentated longitudinal stripes on a brownish yellow ground provide the general scheme, which is followed by Pierids (*Perhybris, Dismorphia*), Danaids (*Lycorea*), Heliconians (*Heliconius narcaea*) and even some moths (*Chetone*). I have elsewhere spoken of a tendency of certain districts to produce uniformity in their inhabitants, and although kindred phenomena are not wanting in India, or particularly in Africa, they are far less conspicuous there than in America.

Just as the present mammalian fauna of South America is wanting in gigantic forms, so too its Lepidoptera are for the most part of only medium size. Only in *Caligo*, *Morpho*, some Sphingids and the giant Noctuid *Thysania agrippina* do we find great dimensions attained; there are no actual parallels to the huge *Attacus*, or to *Ornithoptera* with its great uncouth females. And as in size, so also in shape there is not the same tendency towards grotesque, unintelligible forms as one is struck by in many genera of the Old World, such as *Leptocircus*, *Scricinus*, *Drurya antimachus*, etc. Beyond the development of tails in normally untailed families (*Nympholidae*, *Erycinidae*, *Hesperidae*) there is little that is very strange in the aspect of the American Lepidoptera,

In addition to these peculiarities of the American fauna, there are some others which are not so difficult to explain. In a large number of districts, especially in South America, there are no regular wet and dry seasons. In the neighbourhood of Rio de Janeiro sudden changes are possible on almost any day of the year, and the rainless periods are variable both in their duration and in the time of their arrival. Thus the conditions there — as we have already briefly mentioned — do not lend themselves in the same pronounced way to the development of **seasonal dimorphism** as in many localities of the Old World, where the conditions of weather are perfectly regular, the rains and the heat of the sun being confined to certain months.

Polymorphism also does not seem, in another respect, to be developed to the same degree as in the Old World; namely, in its local conditions. Although in *Papilio lysithous*, for example, we observe the same conditions which obtain in many Indian species, namely that in different districts it mimics the different



INTRODUCTION. By Dr. A. SEITZ.

Aristolochia-Papilios which occur there — e. g. in South Brazil as P. pomponius, mimicking P. perrhebus, in Rio de Janeiro in the form lysithous, copying P. agarus — yet without doubt such cases are wanting in America as that of the Indian P. memnon, in which some 30 different forms of female belong to one almost constant male form.

The strict **localisation** of Lepidoptera in America is easily explained by the peculiarities of the conditions of vegetation. Like the Old World steppes, the prairies of North America and the Pampas of South America are not adapted to produce a great abundance of forms or even a moderate number of showy and elegant species. Hence we find *Morpho*, the larger Nymphalids, *Castnia*, etc., disappear rather suddenly from the district as soon as we leave the great Southern and Central American forest region. Hence, also, the West Indies, which are either poor in forests or altogether devoid of them, are far behind the neighbouring mainland in respect of their lepidopterous fauna, while conversely the East Indian Archipelago is especially rich in species.

It greatly surprises those who visit different parts of the American continent to notice the great **resemblance between northern and southern districts** which are separated by vast tracts of land differing entirely from both. The Argentine pampas produce species altogether analogous to those of the United States, often even the same species, while they are absent from the whole of the Neotropical forest region which intervenes. Almost at the same latitude where the last *Morpho* leaves us, whether northward or southward, we find *Colias, Pyrameis carye* and *Deiopeia* tlying. *Emptoieta claudia* occurs both in the United States and in Uruguay in hardly distinguishable forms, while in the intervening tropical South America it is entirely absent. being supplanted by the very different *Eupt. hegesia*. Nothing analogous is known in the Eastern Hemisphere: the numerous Acraeas of South Africa vanish in the tropical zone and do not reappear north of the Sahara; *Argynnis*, which in America appears again in Chili and Argentina after missing the tropics, vanishes finally in the East on reaching the tropical region; neither South Africa nor Australia possesses any species of the Nymphalid group, which is so plentifully represented in the North. On the contrary the well-represented *Precis, Amauris*, etc., of South Africa do not reappear in North Africa or in Europe, and of other characteristic genera of the Old World, such as *Teracolus* and *Charaxes*, scarcely one species in a hundred extends from one temperate zone across the tropics to the other.

The rôle which the individual families play in the American fauna will be easily seen from the special part: attention need only be called here to a few points which result from a comparison of the fauna of the New World with that of the Old.

The **Papilios** of temperate North America surpass those of the corresponding latitudes of the Old World. San Francisco, St. Louis or Washington has two or three times as many species of *Papilio* as Spain. Algiers or Asia Minor, while on the other hand *Parnassius*, rich as it is in forms in the Old World, has only a few somewhat scattered, subordinate forms in the New.

The **Pierids** are pretty equally represented on both sides of the Atlantic, especially since some have been transplanted during the last century.

The **Danaids** show an extremely close parallelism. With only a single species crossing the 40 th degree of N. latitude, their number so increases in the tropics as to become dominant, and the number of very closely related forms would be almost equally the same in the Western Hemisphere as in the Eastern if we reckoned the Neotropids, about to be mentioned.

But the **Satyrids** are considerably less prominent in the temperate zone of the New World than in that of the Old. In the tropics, where the Satyrids wane and tend to give place to other groups, the contrast becomes less.

Preeminent among American forms are the **Ithomiidae**, related to Danais, and which have been designated Neotropids, from their characteristic occurrence in the Neotropical region. Even the earliest naturalists who made any adequate observations in South America, such as BATES and WALLACE, were astonished at the enormous number of individuals, as well as the multitude of species which occurred together in small and circumscribed localities; BATES even wondered how the species, often deceptively similar to one another, managed to find out their right mates for copulation. HAASE, on morphological grounds, compares with this group, so rich in species, the genus *Hamadryas* of the Old World, which is equally poor in forms; from the biological standpoint it is better compared with *Euploca*.

The Nymphalids, as one of the most universal groups, occupy a prominent position in both hemispheres. It is hard to say on which continent their preponderance over certain other families of Rhopalocera is the most conspicuous. It is the Nymphalids which include most of the forms that are common to both hemispheres. Vanessa antiopa, Pyrameis cardui and atalanta, Polygonia c-album, Argymis triclaris, freija, frigga, chariclea, etc., connect the American fauna with the eastern and to a certain extent form a bridge.

The **Erycinids** of the Old World do not come anywhere near the wealth and variety of forms to which this family attains in America. To little over 100 species of the Eastern Hemisphere there are above 1000 in the Western, and at the same time the former are comparatively uniform structurally while the latter show manifold differences. America not only produces a number of original forms in this family, but

it is also rich in examples of mimicry, in which Erycinids copy members of the Nymphalids, Ithomiids and even protected Heterocera. Thus *Themone pais* mimics a *Mechanitis, Themone poecila* a *Phyciodes, Ithomeis* and *Compsotheria* copy Neotropids, *Lyropteryx olivia* resembles in flight a *Calodesma* of quite the same colouring, and the little *Syrmatia*, with their quick, buzzing flight, bear, as they dash past one, more resemblance to flies than to butterflies.

The Lycaenids show, in the northern Nearctic region, many forms belonging to the genus Lycaena or nearly related thereto; but as one proceeds further south *Theela*-like forms increase, much as in the Old World. These Neotropical forms greatly exceed in size and brilliance the Indian Arhopala.

The most interesting American group is unquestionably the **Hesperids**, which in many South American localities occur in such a wealth of forms and individuals as to surpass, in variety and abundance, all the rest of the Lepidoptera. The long-tongued species appear to be the sole fertilising agents for some plants, and the picture of the white-flowered bushes thickly covered with black *Eantis* abides vividly in the memory of everyone who has collected in South America.

Among the Heterocera the Zygaenids are far less prevalent than the **Syntomids**, which are extremely well represented and often lavishly adorned with metallic colours. Here a wide field is opened for mimicry. The moths which are still commonly designated "Glaucopids" appear in the most wonderful garb, some copying the predacious Hemiptera, others beetles, but the largest number Hymenoptera. The strongest Hymenoptera in the world, the species of *Pepsis*, which wound bird-spiders with their sting and carry them off as food for their offspring, are copied by a very large number of Syntomid species. Under the name of "Marimbondo" this wasp is dreaded in America both by men and animals, on account of its terrible sting, so that in fact no better model could be found for protective resemblance. Entire genera of Syntomids, such as *Macrocenenc*, almost exclusively copy these giant wasps.

The **Castniids** present, in some measure, a transition from the moths to the Hesperids. The true Castniids, such as the genera *Castnia*, *Gazera*, etc., are absolutely confined to America and indeed to its tropical and subtropical parts. We see in them moths with entirely the habits of butterflies, which not only feed, like many day-fliers, at flowers which grow in the sun, but also station themselves on points of vantage at the extremities of the foliage where they drive off their enemies, play with their own kind, and lay wait for the passing females.

The Arctiids of North America present many similar forms to those of the Old World, several genera and some species, such as Arctia caja, Parascmia plantaginis, Phragmatobia fuliginosa, being common to both hemispheres, without belonging to the holarctic polar fauna. The specifically American forms do not make their appearance in numbers till further south, where they appear of an entirely different build and colour; as *Ecpantheria* and *Halesidota*, which are specially developed in Central America, and the curious *Palustra*, whose larva is aquatic. But although the most singular forms of "tiger-moths" live in the tropics, the gayest and most beautifully marked are found in temperate North America, such as *Apantesis*, *Platyprepia*, *Haploa*, etc.

The Lithosiids, which in America, as in the Old World, are represented mostly by small forms, are often, especially in tropical America, brightly coloured and of diurnal habits. In North America itself scarcely 50 forms occur, they seem to reach the height of their development in the warm valleys of the Andes, just as in the East the slopes of the Himalayas have been shown to be particularly favourable to their production. No species are known which are common to both hemispheres; indeed hardly any genera, if we follow HAMPSON (as against KIRBY and DYAE) in removing *Utetheisa* from the family *Lithosiidae*.

The **Liparids** of America, in so far as we accept the present composition of this family, are considerably less prevalent than those of the eastern world. *Ocneria dispar*, the "gypsy-moth", is an introduced species, whereas *Orgyja antiqua*, which is widely distributed in the west of the Old World, and reaches far north, is to be regarded as indigenous. We assume this to be so, although the species is common at some of the European ports (particularly Hamburg) and the larva is fond of spinning up on bales of merchandise, where the sluggish female also lays its eggs, so that every year large numbers are probably dispersed to the four winds. In the genus *Gynaephora* the Liparids of America possess the species *G. groenlandica* and *rossii*, which reach the farthest north of all the Heterocera – perhaps of all Lepidoptera.

The Limacodids, a family of universal distribution, are very plentifully represented in South and Central America, and develop elegantly marked, though small forms, many of them with a silky or metallic gloss on the wings. From temperate America about 50 forms are known, which is about $^{1}/_{10}$ of the total of known species. From the whole of America perhaps three times as many are known, or over $^{1}/_{3}$ of the total of known forms. It is remarkable that the northern part of America produces a far larger number of forms than that of the Palaearctic Region, which in many districts is very poor in Limacodids; thus in the whole of Europe only two species occur, i. e. less than $^{1}/_{2}$ per cent. of the known species.

The **Psychids** as still constituted at present, do not form a homogeneous family. The case-making of the larvae and the degeneracy of the female are due to convergence, though they have repeatedly been taken to indicate relationship. In America the Psychids play only a small rôle; only 15 per cent. of the

INTRODUCTION. By Dr. A. Seitz.

200 known forms inhabit the western continent, and only about a dozen of these occur in temperate North America.

It might appear singular that a family whose females are each and all immovable should have such an enormous range as the Psychids, which are represented in the remotest islands, such as New Zealand, Teneriffe. etc., and often by characteristic species. But it must not be forgotten that their larvae are extremely active and endowed with great powers of resistance, and many, if not all the species are parthenogenetic, i. e. capable of propagating without previous copulation. Nothing would be more erroneous than to infer the existence of a submerged continent from the occurrence of the Psychids on both coasts of the Atlantic. Their transplantation from America to the Old World and vice versa could very easily be effected by drift-wood. I have fished out from the Plata River floating boughs on which a number of cases of Oiketicus platensis were spun up, some containing sound larvae, others living pupae. It appears that the larva is capable of making its case watertight. I found large Psychid cases on the coast of North-Shore in the harbour of Sydney, Australia, which were spun up on the rocks, and over which every wave washed at flood-tide; they contained uninjured larvae. Thus their transplantation by means of drift-wood is not at all improbable; indeed they are not even threatened by many special dangers for their long and troublesome voyage. Psychid larvae can fast for a very long time, and when this is no longer possible to them, any food is accepted. The larvae of Amicta febretta, which I took in numbers in North Africa from a dry desert-plant, were fed up to the pupal stage in Europe on pear-peel; and inasmuch as a single female Psychid is sufficient to increase the range of a species, the greater wonder is that no species of this family is cosmopolitan, indeed that there is none which is possessed by America in common with the Palaearctic fauna.

The Lasiocampids as a whole are not yet sufficiently well known to allow of our forming a definite judgment as to their distribution. Without doubt America has over one-third of the 800—1000 existing forms. With the very large number of species which are already known from South America, it must be assumed that a more thorough exploration of the interior of Brazil will bring to light many more. As at present constituted, the group is not even homogeneous, so that many alterations are to be expected when the Neotropical forms, in particular, are fully worked out. As the family is now constituted, America possesses numerous exceptionally interesting forms. The larvae of the genus *Megalopyge*, remarkable for their peculiar tutts of hairs, are dreaded in America on account of the inflammation which these hairs cause. In one lady who came under my treatment they had produced swellings on the arm and breast, with several days' fever, so that their effects even exceed in intensity those of the hairs of *Thaumatopoea*. Sometimes there is an unusually pronounced sexual dimorphism in this family, as in *Heliconisa pagenstecheri*, whose female was long known as *Dirphia costora*. In the New World, as in the Old, some of the Lasiocampids are of economic importance.

The Saturnids, of which there are somewhat over 400 species in all, are almost equally divided between the New World and the Old. In this magnificent group the relative richness of America is shown by its attaining, in the number of its Saturnids, to a total equalling those of the great continents of Asia and Africa combined. Against six for the whole of Europe, some 40 forms inhabit temperate North America. The Ceratocampids, too, which are related to the Saturnids, and of which there are about 50 forms, belong to America alone; whilst the Brahmaeids of the east possess hardly more than a dozen forms. On the other hand America is somewhat behind the Old World in respect of the true Bombycids.

The American Sphingids, in comparison with those of the Old World, show a proportion of 3:5, 370 out of about 1000 known forms occurring in the New World. The exhaustive work of ROTHSCHILD and JORDAN has thrown a very full light on the distribution of this family. America is particularly rich in gigantic hawk-moths, such as *Pachylia*, *Cocytius*, *Pholus*, *Pseudosphinx*, etc. One would expect, from the extensive powers of flight of most Sphingids, that quite a number of representatives of this group would be common to both hemispheres, which, however, is not the case; only quite a few species, such as *Celerio lineata* and *gallii*, appear in both without any very material differences.

In the Notodontids we have another heterogeneous group, in the composition of which alterations will certainly be made — at least by its splitting up into several groups — when it is worked out morphologically with a regard for the finer anatomical details.*) It is therefore of little value to fix the number which belong to the Western Hemisphere, out of the 600 odd species at present placed in the Notodontids. They form by far the greater part; the genera Rosema, with grass-green forewings, Nystalea, with its noctuid habits, the North American Datama, Heterocampa, etc., are rich in species which play an important part in the western continent on account of their richness in individuals.

In the Noctuids, conditions are much the same as in the Old World, especially as described in dealing with the Palaearctic Noctuids (vol. III, p. 11): in the south more diurnal species, in the north duller coloured genera (*Mamestra*, Acronicta, Agrotis, Hadena, etc.) which sleep by day; but in the north, in addition, a wide distribution of the Catocalids, lightly sleeping night-fliers which are specially adapted for

^{*)} As PACKARD has done for the North American species.

INTRODUCTION. By Dr. A. Seitz.

their resting posture, but have preserved their bright colour on the underside as well as on the hindwing, which is concealed beneath the grey forewing. In the tropics of America the Noctuids recede in point of numbers, as only a few groups, such as *Hyblaca*, *Laphygma*, *Prodenia*, etc., appear in large number at times; however, the western tropical species frequently develop gigantic forms, such as *Erebus* and before all *Thysania agrippina*, which has the largest expanse of wings of all the known Lepidoptera.

The **Geometrids** show a very uniform distribution throughout the world. Their relatively weak flight makes them insecure on islands, and is a hindrance and menace to their propagation in the smaller storm-beaten islets. This general rule holds also for America, and so does the other rule, that the generally duller and darker colours of the temperate climate give place to brighter and often beautifully marked colouring in the warmer regions. As many species extend far northwards, there is a possibility of communication between the two hemispheres in respect of their Geometrid fauna; and although there are far fewer Geometrids than Noctuids common to the two, yet several species, such as *Eugonia magnaria (alniaria)*, *Hydria undulata, Anagoga pulceraria*, etc., occur in both without any essential differences.

Among the larger Geometrids, the genera Azelina, Clysia, Oxydia, Prochoerodes and Sabulodes are particularly prominent in America. In their habitus they borrow a good deal from the forms of other groups which inhabit the same region, but without showing any mimetic tendency. As in the Eastern Hemisphere, metallic colours are only developed exceptionally in the American Geometrids (Ophthalmophora); on the other hand we are confronted with true American schemes of colour and markings in the brightly coloured bands on a black ground which occur in Scordylia, Nelo, Sangala, etc.

The above is in broad outline a comparative picture of the American fauna and that of the Old World. It ought to be mentioned that some groups, such as the *Cymbidae*, are not represented at all in America; others, such as the Nyctemerids, only by a few forms, which might probably be better referred to some other group. It is very strange that the nearest representative of the tropical American genus *Urania* belongs to South-East Africa; cases like this belong to the at present still very numerous geographical puzzles.

Diurna, Butterflies.

With the exception of the Neotropical Brassolids, all the American butterflies are day-loving insects. Even the dark-coloured Satyrid genera and the colourless *Haetera* and *Ithomia* the by day, though in the dusky shade of the woods. What was said in the Introduction as to the colouring and the scheme of marking of the Lepidoptera of the New World, is applicable in a special degree to the colours of the frequently gorgeous butterfly-wings. In spite of the very considerable abundance of true Rhopalocera, they do not in America preponderate over the second group of Diurna, the Grypocera, to such an extent as in the Old World.

A. Rhopalocera, true Butterflies.

The differences from the Grypocera are given in vol. I, p. 7. The distribution of the Rhopalocera in America extends from Greenland to Cape Horn. In the islands lying to the south of this there do not appear to be any butterflies. These attain in the American genus *Morpho*, allied to the Satyrids, a high degree of development; among the Nymphalids we find in *Agrias* evidently modern forms, and among the Ithomids the most prononced examples of Mimicry.

Division I: Papilionina.

The Papilionina do not in America attain the same dimensions as in the Old World, for example in the Indo-Australian Ornithoptera. The largest American Papilionid is Pap. homerus, an island species. The genus Parnassius, rather prominent in the north of the Eastern Hemisphere, is much less so in America. The Pierids are similar to those of the Old World in their habits, and extend, like these, far into the north polar region. (SEITZ.)

Family I: Papilionidae, Swallowtails.

Palpi short, lying close to the head, occasionally long and projecting (*Teinopalpus*, North-India). Antennae of three types according to the structure of the segments: the fine sensory hairs beneath and laterally almost equally distributed over the proximal part of each segment, or there is a cavity on each side covered with sensory hairs (reminding one of the Nymphalids), or there is only one row of such cavities present (reminding one of the Pierids); the upperside scaled or naked. Mesothorax very strongly built, the sternum completely fused with the episternum, the suture (as in the Pierids) outwardly quite wanting. Fore legs fully developed; fore tibia with spur on the underside; claw simple, very rarely cleft as in the Pierids*); paronychium and pulvillus wanting. Cell of both wings closed; in the forewing the second discocellular (between the 1. and 2. radial) the longest, the 2. radial arising from the lower angle of the cell, the 3. discocellular standing in or almost in the prolongation of the median, hence four veins arising from the hinderside of the cell, upper submedian vein often present as a short transverse vein arising from the median near the base, 3. submedian vein short, free, running into the hindmargin; hindwing with precostal vein, and one submedian vein. — Egg round or flattened, without prominent sculpturing. — Larva before the first moult with rows of bristle-bearing tubercles, which in the later stages disappear, or are

*) In one species of Leptocircus.

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PAPILIO. By Dr. K. Jordan.

replaced by fleshy processes or hard spines; on the neck a fleshy, reversible fork of a red or yellow colour, secreting a scent, and being stretched out in defence (the osmaterium); lives free, but some species bend down the edge of a leaf so that a sort of tunnel is formed in which the larva conceals itself; some larvae are gregarious. — Pupa fastened at the anal extremity and by a thread encircling the thorax and wing-cases, or lying in a loose cocoon on the earth or just under its surface; three moveable abdominal segments.

The family is cosmopolitan, but only a few forms cross the polar circle. Except Africa, where the Aristolochia-Papilios are wanting (only Madagascar has one species), the tropics are characterised by their richness in that group and the Kite-Swallowtails, whilst the temperate zone of both hemispheres possesses in *Parnassius* a type which is not met with in the true tropics; *Baronia brevicornis*, indigenous to Guerro, West Mexico, is the most southerly form recalling *Parnassius*.

Whilst in the Old World there are quite a number of genera besides the large comprehensive genus *Papilio*, all the American forms belong to only four genera: *Papilio*, *Euryades*, *Parnassius* and *Baronia*.

1. Genus: Papilio, Swallowtails.

Forewing always with median spur (1. submedian), at least one of the discocellulars placed longitudinally; hindwing with precostal cell. All the species have the pupa attached by a girth. The socalled genus *Papilio* falls into 3 divisions, which are sharply separated from one another in the larva, pupa and imago. This natural classification was founded by HORSFIELD in 1856, but not recognised by later authors (ERICH HAASE excepted). The forms of the first group, the Aristolochia-Papilios, so tenacious of life, have a strong smell, and are often minicked by species of the other two divisions, and in consequence of this similarity the models and mimics have been erroneously regarded by some authors as closely allied.

A. Aristolochia-Papilios.

Antenna without scales, underneath on both sides with a cavity on each segment. The outer ventral row of spines of the tarsi not separated from the dorsal spines by a spineless longitudinal depression. — Larvae on Aristolochia, rarely on allied plants; densely covered with very short hairs, velvety, only the head, the prothoracic plate and the legs being shiny; each segment with a belt of fleshy tubercles, which bear hairs, but no strong spines; the anterior tubercles often prolonged. — Dorsum of the pupa incurved, wing-case strongly expanding sideways; on each side of the abdomen dorsally a row of humps or lobes, which often form an almost unbroken ridge. — Tropical insects, represented in North America by 2 species (*P. philenor* and *polydamas*).

The American Aristolochia-Papilios are divided into 2 sharply characterised subdivisions.

Section A.

Body with red spots. Cavities of the antenna very distinct; precostal cell distally widened, cell of the hindwing more or less pointed. — Here belong most of the forms. They are almost all woodland species; some are only found in the shade of the forest. The butterflies are taken in open spaces in the woods, on their outskirts, and on the banks of rivers, where they frequent flowers, or imbibe moisture from the damp sand. The $\Im \sigma^2$ are generally good fliers, while the \mathfrak{A} are mostly slow and heavy on the wing. Some species inhabit marshes, others occur only in dry, sandy places in the woods.

Ascanius-Group.

The species of the *ascanius*-group, with which we begin, have a spatulate tail. The two sexes are similar. The σ^{n} has on the hindwing a hindmarginal fold, covered with white wool.

columbus. P. columbus H.-Sch. (= gundlachianus Fldr.; grotei Blake) (1 a). The brightest coloured American Papilio, which may be recognised by the brilliant blue bands on the forewing. — The dark ash-grey larva is striped longitudinally, the head and thoracic legs are black; the black longitudinal stripes in part margined with white; the anterior and posterior segments bear long pointed tubereles which are partly white. — Flies in Cuba, and occurs not infrequently in the mountainous eastern part of the island, especially near the coast, where it is met with on flowers, and sometimes also drinking at pools.

ascanius. P. ascanius Cr. (1a). A broad white band traverses both wings; on the hindwing it is more or less red. — The larva is light brown, and bears pointed tubercles on all the segments. The imago, which hitherto has only been observed in the province of Rio de Janeiro, flies in the neighbourhood of Rio over marshes, where it can only be followed with difficulty and often by wading in the water; the species of Aristolochia on which the larva feeds only grows in such situations. According to Mr. J. ARP the species is by no means scarce at Rio de Janeiro in these swamps, but only in exceptional cases goes far from them; and it is on account of this inaccessibility of its haunts that good specimens are not common in collections. Larva October to April.

12

P. agavus Drury (tb). The red anal spot of the hindwing very large, Z-shaped. The abbreviated agavus. white band of the hindwing is somewhat variable. Although the species is quite common even in gardens in the neighbourhood of Rio, especially in damp, shady places, we are still ignorant of its early stages. The insect frequents flowers, and is easy to catch. - Minas Geraës southwards to Rio Grande do Sul, westwards to Paragnay and the adjoining parts of Argentina; not extending to the foot of the Andes.

P. proneus Hbn. (= phryneus Luc.) (1 b). Both wings with narrow white band, the red sub-proneus. marginal spots of the hindwing straight or slightly curved; anal spot not V-shaped. - Minas Geraës to Parana: near Rio only in the Organ Mountains.

P. chamissonia. Both wings with white band, that on the hindwing abbreviated; cell-spot of the hindwing not extending further towards the base than to the 2. median; red anal spot V-shaped. - The larva is brownish black, with an oblique white band, extending laterally from the 6. segment to the tubercle on the 7. The pupal stage lasts three weeks. The butterfly is very common and is one of the earliest spring species (August). From August to April there are at least three generations. — diodorus Hopf. diodorus. U (= campeiro Foett.) (1b) has entirely white fringes. The breadth of the white band is variable. Minas Geraës; in the interior from São Paulo; Goyaz; Bahia. - The form chamissonia (= ascalus Godt., chamissonia. echedorus Boisd., eurydorus Luc.), described by Eschscholtz, occurs near Petropolis, in São Paulo, Parana and S. Catharina. Near Rio itself the species is absent. In this form the fringes are partly black, at least at the extremities of the veins. The specimens with a broad white band on the hindwing may be designated as ab. bunichus Hbn.; these are especially common in São Paulo and in the Organ Mountains. bunichus.

P. perrhebus. Wings entirely without bands. The larva lives on Aristolochia ciliata, and bears on all its segments tubercles which are partly white and partly yellow; an oblique band on the 6. and 7. segment is yellow. We know two geographical forms of this species. - In Brazil, from Sio Paulo to Rio Grande do Sul, in Paraguay, and in the neighbouring parts of Argentina, occurs a dark form, in which the head, the palpi, and the submarginal spots on the upper surface of the hindwing are distinctly red; this is perrhebus Boisd. (1a). - The form from Buenos Aires, the province of Entre Rios, and perrhebus. Uraguay, is damocrates Guen. It is much paler; the head and palpi are black, and the submarginal spots damocrates. on the upper surface of the hindwing are not bright red. The species is especially common near rivers.

P. phalaecus Hew. (1b). The only Aristolochia-Papilio with a spatulate tail which has hitherto been phalaecus. found in tropical America between Costa Rica and Paraguay. The body is very hairy. The white band, which traverses both wings, is intersected by black veins. - Eastern Ecuador.

P. photinus Doubl. (t d). Upper surface with blue gloss, especially in the σ^2 . Wings without bands; photinus. hindwing with two rows of red spots. - Mexico to Costa Rica; a common species.

P. alopius Godm. & Salv. Spots on the hindwing smaller than in P. photinus, at least partly white, alopius. those of the inner row very small, partially wanting. - West Mexico; Nicaragua.

P. dares Hew. (t d). Only one 2 known, which is in the British Museum (coll. HEWITSON). Tail dares. short; forewing with a small white spot on the disk; hindwing with two rows of red spots, which are larger than in photinus. - Nicaragua.

P. montezuma Westw. (1a). Forewing without band. Hindwing with a row of red submarginal montezuma. spots. -- Mexico to Nicaragua; one of the commonest species.

Aeneas-Group.

The following forms, which have white marginal spots, we unite as the *aencas*-group. The species are partly hard to differentiate, especially as the two sexes are often very unlike. Very little is known about the earlier stages. Many of the species inhabit marshy woods, where the larvae live on Aristolochia. In consequence of the inaccessibility of these forests much a number of forms are still very rare in collections, and there are cer-tainly still some species which have hitherto escaped the net. Scent-organ of the σ^2 mostly with white wool, more rarely with black scales.

P. hahneli Stgr. (1c). One of the most remarkable of the American Papilios, and doubtless the hahneli. best discovery of the successful collector after whom the species is named. Tailed. Forewing with three yellow-grey bands or patches; hindwing with area of the same colour, occupying the greater part of the wing. - Massauary, near Maués, Amazon River. Collecting in the neighbourhood of the Amazon, from Para to the foot of the Andes, seems to be more difficult nowadays than formerly. It is true the steamboat takes the collector from place to place, but in the neighbourhood of the larger settlements there is no longer much for him to seek, and living has become extraordinarily expensive. And it is difficult to find a place near the forest fit to live in and secure against flagrant robbery, and the collector is very

PAPILIO, By Dr. K. JORDAN.

dependent upon chance in this respect. -P. hahneli has not been again discovered; but so many Amazon species are represented in collections by only a few specimens that it must be assumed that the real haunts of this insect are not yet known.

P. triopas. Forewing with two bands. Hindwing small, recalling the Old World Troides (= Onithoptera). The form from the Lower Amazon and Dutch and French Guiana is the commoner in collections; triopas. this is triopas Godt. (1 c). - The form from British Guiana, which is called mithras Grose-Smith, has smaller with ras. and paler spots. — A woodland species like its allies. The 2 flies slowly near the ground, whilst the or has a swifter flight and generally remains at a considerable height.

- chabrias. P. chabrias Hew. (1 c). The forewing in both sexes has a row of submarginal spots, which however are often wanting in the 2. The central area of the hindwing is situated somewhat further towards the margin than in P. triopas, consequently the cell-spot is smaller. - Upper Amazon, from Ega to Ecuador and Peru. Neither this nor the preceding species has so far been found in the large district between Obidos and Ega.
- **P. coelus** Boisd. (σ = vercingetorix Oberth.) (1 d). Forewing with a white spot, obsolete at the coelus. margins, which fills up the extremity of the cell, and extends on to the disc. Hindwing with red band on the disc, in the d composed of four spots, in the Q of six. - French Guiana, the d in Oberthür's Collection, one 2 in the Paris Museum.

P. quadratus. Forewing long; hindwing in both sexes with a band consisting of yellowish white spots on the disc close to the cell, and on the under surface in addition with a red spot at the hind angle. -quadratus. In the name-typical form quadratus Stgr. (2 b), of which only one of is known, the forewing has a yellowish spoliatus, white spot before the 2. median. The specimen was taken near Manicoré on the Rio Madeira. - In spoliatus Stgr. neither sex has a spot on the forewing. Upper Amazon; rather rare, near Iquitos, Pebas, S. Paulo de Olivença and other places.

pizarro. **P. pizarro** Stgr. Abdomen in the σ^2 quite black, in the φ with a red spot before the apex on the underside. Forewing without spots, also none in the fringes. Hindwing with whitish yellow area, which in the σ^2 consists of three or four spots, in the \Im of three to six. — Upper Amazon.

steinbachi. P. steinbachi Rothsch. (2a). This fine species has recently been discovered by J. STEINBACHI in the eastern part of Bolivia. Forewing in both sexes with a large white spot before hindmargin; hindwing with a red band. Santa Cruz de la Sierra, between the end of February and June; also received from Mapiri.

P. klagesi *Ehrm.* (2 a). The σ^2 of this peculiar little *Papilio* is not known; only four \mathfrak{P} have been klagesi. found. The hinder angle of the cell on the forewing is quite rounded; neither the fore- nor the hindwing has distinct fringe-spots. Forewing with a white band before the hindmargin; hindwing with a band composed of red spots. Abdomen entirely black, even at the tip. - Suapure, on the Caura, Orinoco, taken by S. M. KLAGES and his brother in February and March, 1899. Perhaps the species belongs to the lysander-group.

P. aeneas. Palpi black, as in the preceding species. Abdomen in the \mathcal{P} with a small red spot beneath before the tip. Sexes very different. σ with green spot on the forewing; hindwing with red nonopalescent central area, not extending further towards the base than to the middle of the cell. In the \mathcal{P} the forewing is either entirely black, or bears one or more white obsolete spots on the margins. Guiana; Upper Orinoco; Amazon from Pará upwards; eastern slopes of the Andes of Peru and Bolivia. Several aeneas. geographical forms. A woodland species, about whose earlier stages nothing is known. - aeneas L. (= gargasus Hbn.; aeneides Esp.; bochus Luc.) (2b) inhabits the three Guianas. The green spot of the σ^2 is removed from the cell, and is usually wider before than behind the submedian vein. The 2 occurs in two specularis. forms: 2-f. specularis R. & J. has on the forewing a large white spot before the 1. median, and usually *dido.* several smaller ones, of which one is in the cell. In the second form, \mathcal{P} -f. dido R. & J., the forewing has marcius no white spots. - marcius Hbn. (2b) is the subspecies from the Lower Amazon. The o' is similar to that of *acneas*, but the last red spot but one on the under surface is larger. We know only one form of the $\hat{\varphi}$; in this the white spot of the forewing usually extends to the 2. median, and the median red spots of the linus. hindwing are close together. - linus R. & J. from the Middle Amazon (Santarem, Obidos, Massauary) was unknown to Bates. The red spots on the underside of the hindwing of the σ are paler than in the last subspecies, and stand closer together and nearer to the cell. In the 9 the red spots are united into an damis. uninterrupted band. — damis \vec{R} . & J. inhabits East Peru. The green spot of the σ is larger than in the preceding forms, and the spots on the under surface of the hindwing are reddish white. The 2 occurs in pyrometas, two forms: 2-f. pyrometas R. & J. (2b) has entirely black forewing; the red spots of the hindwing are eucharia confluent, forming a band. In φ -f. eucharia R. & J. the forewing has a large white area with undefined locris. margins. — locris R. & J. is in the σ similar to the last subspecies, but the red spots on the hindwing are larger. The 2 has always a white area on the forewing: the red spots on the hindwing are separated

PAPILIO. By Dr. K. Jordan.

from one another, the spot before the 1. median being the largest. Bolivia. — **bolivar** Hew. (2 a) inhabits bolivar. the Upper Amazon and the Orinoco. The red area on the hindwing of the σ is small, and is whitish yellow on the under surface. Forewing of the φ black, with white spots on the fringes; hindwing with a whitish yellow area.

P. dardanus Fabr. (= tros Fabr.; opleus Godt.) (2c). Tailed. Forewing in the σ with a green dardanus. spot before the hindmargin; the red area of the hindwing not opalescent. \mathfrak{P} with a white area on the forewing, with obsolete margins. — An exclusively Brazilian species, which hitherto is only known from the province of Rio de Janeiro.

P. orellana *Hew.* (2 c). The most beautiful species of the *aeneas*-group. Forewing in both sexes *orellana*. black, bluish in a side-view, with white spots on the fringes. Hindwing in the σ with a very large red area, not opalescent; in the γ with a broad red band. — Upper Amazon, from Ega to Iquitos.

P. sesostris. Forewing in the σ^2 with very large green area which touches the cell; hindwing either black or with a red spot before the hindmargin. Forewing of the \Im with at least two white spots; the red band on the hindwing generally broad. Scent-organ of the σ^2 with white wool, except at the base, which is black. Mexico to the Amazon, in three subspecies. — The northern form is **zestos** Gray (3a). The σ^2 zestos. has always a red spot on the hindwing. In the \Im the band on the upper surface of the hindwing is bright red. South Mexico to Costa Rica. — tarquinius Boisd. occurs from Panama to Ecuador and North Venezuela. tarquinius. The upper surface of the hindwing of the σ^2 has mostly a red spot on the band on the under surface is more obliquely placed. In the \Im the second white spot on the forewing is somewhat larger than in zestos, and the band on the under surface of the hindwing of the σ^2 , and the upper surface are placed somewhat nearer to the margin. In the \Im the two white spots on the of the spots on the under surface are placed somewhat nearer to the margin. In the \Im the two white spots on the forewing are widely separated from the cell. Orinoco; Guiana; Pará to Peru; Bolivia; Goyaz.

This species is a strong flier, which appears never to leave the woods.

P. childrenae. The green area of the σ' is larger than in *P. sesostris*, covering also a part of the cell. The 2 has a transverse row of spots before the apex of the forewing, as well as two spots on the disc posteriorly. Distributed from Guatemala to Ecuador in two subspecies. — childrenae Gray (3a) is the *childrenae*. Central American form, which is found from Guatemala to Panama. Forewing of the σ' with a white spot before the apex. Band on the hindwing of the 2 bright red. — **oedippus** Luc. has in the σ' no white spot *oedippus*. before the apex of the forewing, or only a very small one. In the 2 the band on the hindwing is a somewhat yellowish red on the inner side. Colombia and Ecuador.

P. erlaces. Palpi always black. Fringes of both wings spotted with white. Forewing of the σ^{σ} with a gray-green spot before the hindmargin; hindwing with three red, strongly opalescent spots. In the 2 the margin of the 8. abdominal segment red all round; forewing with large cell-spot and 2 or 3 discal spots. Ecuador to Bolivia. — lacydes *Hew.* (2 = equestris Oberth.) (3b) has rarely a white spot on the *lacydes*. forewing of the σ^{σ} , the spots on the under surface of the hindwing small, almost entirely white. In the 2 the cell-spot of the forewing large; band of the hindwing white. In Eastern Ecuador. — xanthias *R. & J. xanthias*. (3b). Forewing of the σ^{σ} almost always with one or two white spots; spots on the under surface of the hindwing varying from white to red. Cell-spot of the 2 triangular, second discal spot larger than the first; band on the hindwing pale yellow. North-east Peru, southwards to Huánuco. — erlaces *Gray* (3a) is the *erlaces*. most southerly form. It inhabits South-east Peru, Bolivia and North Argentina. Forewing of the σ^{σ} rarely without large white spots; hindwing on the underside with 5–7 red spots. Forewing of the 2 usually with 3 white spots besides the cell-spot; band on the hindwing red.

P. burchellanus Wester. (= socama Schaus). Sexes similar. Palpi black. Forewing black, only with burchellanus. fringe-spots. Hindwing with a row of separated red discal spots. Resembles *P. panthonus Cr.* (3b), which however has red marginal spots. — In the interior of Brazil: Farinhapodre, Goyaz; rare in collections. On pl. 3 a specimen of panthonus is figured by oversight as burchellanus.

P. drucei *Bthr.* ($\hat{\varphi}$ = opalinus *Bthr.*) (3b). Palpi generally black, sometimes red. Forewing in the σ drucei. with a green spot, separated from the cell; in the $\hat{\varphi}$ unicolorous, but the fringes spotted. Hindwing in the σ with 3, occasionally 4, opalescent spots; in the $\hat{\varphi}$ with a band composed of 5–7 spots, sometimes rather strongly opalescent. Eighth abdominal segment of the $\hat{\varphi}$ edged with red all round. — Upper and Middle Amazon, and the eastern slopes of the Andes from Ecuador to Bolivia.

P. cutorina Styp: (? = mazeppa Grose-Smith) (3 c). Palpi red. Forewing of the σ^2 with a green cutorina. spot; in the ? without spot, the fringes spotted with white. Hindwing in the σ^2 with two contiguous red spots on the upper surface, the spots on the under surface yellowish white; in the ? the wing has a yellowish white band on both surfaces; 2. and 3. radials close together, the transverse vein between them not oblique. — Upper Amazon and slopes of the Andes of Ecuador and Peru.

P. phosphorus. Palpi red. Forewing somewhat transparent distally; σ with dirty-green spot; hindwing rather strongly dentate, the red spots remote from the cell. Tibiae armed with spines, not thickened.

PAPILIO. By Dr. K. JORDAN.

2 with grey-green area on the forewing before the hindmargin, which occurs in no other 2 of the Aristolochia-Papilios. Colombia; Guiana; Lower Amazon; East Peru; perhaps more widely distributed. A rare insect; phosphorus. probably a swamp species which escapes observation. Two subspecies: - phosphorus Lates (3 c) occurs in British Guiana and at the Lower Amazon. The green spot on the forewing of the σ is narrow and separated from the cell. The forewing of the 2 has a row of 4 white spots on the grey-green area (always?). gratianus. gratianus Her. (3c) inhabits Colombia and East Peru. The green spot on the forewing of the or is much broader than in the preceding form; hindwing with only 3, or rarely 4, red spots, the series not curved. Forewing of the \mathfrak{P} with two white spots; the posterior spots of the hindwing large.

P. vertumnus. Palpi red. Forewing in the σ with a green spot; in the \mathfrak{P} unicolorous or spotted with white. Hindwing of the σ with triangular red area, which consists of 3 or 4 spots, of which the posterior one is usually the longest; in the φ with a broad red band, consisting of 5-7 spots, of which the four posterior ones are more or less completely connected. One of the commonest species, which is often met with in the woods, settling in damp places at the edge of the brooks. Distributed from Colombia *yuracares.* to Bolivia, Guiana and Pará, but not yet found in Venezuela and Brazil proper.*) — **yuracares** R. & J. is the Bolivian subspecies. Only the σ ⁷ is known. The green spot touches the cell, and encloses at least one white spot. Hindwing with at least 4 red spots, of which the anterior two are separated; 5 small spots autumnus. on the under surface. Found by J. STEINBACH from January to April. — autumnus Stgr. (3d). σ : the green spot larger than in the preceding; hindwing with 3 red spots; 4 small red spots on the under surbogotanus, undoubtedly extending further south. – **bogotanus** *Fldr*. Only the \Im known to us. Forewing with bourd white spot; hindwing with rather large red area, the spots on the under surface small. Rio Palcazu northdiceros. wards to "Bogotá". – diceros Gray (= cixius Gray; σ^2 = cutora Gray). σ^2 : forewing usually without white spots in the green area; when present they are transverse, and somewhat obliquely placed; red area of the hindwing smaller than in the preceding forms, the spots on the under surface on the contrary generally larger. 9: forewing with chalky-white area, consisting of 2-4 spots, occasionally only one double vertumnus spot present. Pará to Iquitos. - vertumnus Cr (3c) is distinguished in the 3^r from all the other forms of the species by the short-haired middle and hind tibiae. The φ as in the Amazon form, or the forewing with only one white spot, of which there is sometimes merely an indication. Guiana.

P. lvcimenes. o?: somewhat smaller than P. vertumnus, the red area of the hindwing less triangular and its last spot smaller. \mathfrak{P} : forewing slightly transparent at the apex; the spots somewhat yellowish, not pure white, the cell-spot usually large and extended across the cell; band of the hindwing less bright red than in P. vertumnus. Tibiae of the 3 not thickened. Guatemala to Ecuador, in several subspecies. lycimenes. lycimenes Boisd, is the Central American form. Forewing with a large green spot, which almost always encloses at least one white spot; often a spot in the cell; hindwing with 4-6 red spots. In the 2 the yellowish white spot before the 1. median much larger than the preceding one; band of the hindwing broad, almost always a uniform bright red. Guatemala to Panama; also on the small islands on the west erythrus, coast of the Republic of Panama. - erythrus R. & J. (3d). St. the green spot broader than in the preceding form, reaching to the hindmargin of the wing. $\hat{\varphi}$: the spot before the 1. median of the forewing larger than in the preceding form; the band of the hindwing paler. Central and East Colombia and North paratius. Venezuela. - paralius R. & J. (4a). Small. or: forewing with round vellow-white spot before the 2. median; band of the hindwing short and narrow. 2: spot on the forewing purer white than in the previous subspecies, the cell-spot reduced: the spot before the 2. median the largest; band of the hindwing almost straight. West Ecuador.

P. erithalion. S: tibiae not thickened. Hindwing without distinct red spot behind the 2. median on the upper surface. $\hat{\varphi}$: the spot before the 1. median of the forewing smaller than the preceding spot; zeuxis. band on the hindwing broad, pale on the innerside. Costa Rica to North Venezuela. - zeuxis Luc. (= rhameses Doubl., rhesus Koll., rhamases Fldr., abilius Fldr., rhamses Boisd.) (4a). S: the green area much narrowed anteriorly, enclosing a large white spot before the 2. median; hindwing with 2 or 3 small red spots. 9: the posterior spot of the forewing larger than the preceding one. North Venezuela and erithalion. eastern side of the Cordillera of Bogotá. - erithalion Boisd. (4a) from Central Colombia (Rio Magdalena) has in the σ rarely a white spot on the forewing, which is placed before the 1. median or between the radials. 2: the spot before the 1. median smaller than the preceding one; generally a few small spots cauca outside the cell. — cauca Oberth. σ^2 : the green area of the forewing wanting or merely indicated. \mathfrak{P} : band sadyattes. on the hindwing narrow, curved, separated from the cell. Cauca valley. - sadyattes Druce (4a). σ^{3} : the green area very variable, generally reduced, often wanting; all specimens with at least one white spot, which is placed before or behind the 3. radial, often a green spot in the cell. 2: band of the hindwing almost unicolorous bright red. Costa Rica to Panama.

*) Faunistically we understand by Brazil the eastern part of the continent from the province of Goyaz and Pernambuco to Rio Grande do Sul. In this district we find a fauna which is quite different in many respects from that of the rest of South America.

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PAPILIO. By Dr. K. JORDAN.

P. polyzelus. $\sigma^r \, \mathfrak{P}$: forewing without green area, rarely with a small white spot in the σ^r ; band of the hindwing narrow. nearer to the margin than to the cell. Mexico to Honduras; common. — In *polyzelus*. **polyzelus** *Fldr.* (= candezei *Borre*) (4a), from East and South Mexico, Guatemala and Honduras, the tibiae of the σ^r are not thickened, resembling those of the \mathfrak{P} . — In **trichopus** *R*. *& J.*, from West Mexico, the *trichopus*. tibiae of the σ^r are thickened and bear fine hairs, as well as the 1. segment of the tarsi; the band of the hindwing is on the whole broader than in the preceding.

P. iphidamas. σ : tibiae and 1, segment of the tarsi thickened and covered with fine hairs. φ : forewing at the margin less deep black than in P. erithalion. Mexico to Ecuador and North Venezuela. A common species, which is not easy to distinguish from P. crithalion and P. lycimenes, and is consequently often mistaken for them. — iphidamas F. (= panares Gray, achelous Hopff., incandescens Btlr.) is the iphidamas. Central American form. σ^2 : forewing distally not transparent; the green area usually reduced, always enclosing one or two white spots; often a white spot in the cell; band of the hindwing gradually widened posteriorly, a narrow spot behind the 2. median. 2: cell-spot on the forewing large, usually some small spots beyond the cell; the spot before the 2. median smaller than the preceding one, or obliquely cut off towards the base: band of the hindwing almost unicolorous bright red, its inner margin evenly curved. South Mexico to Panama. - phalias R. & J. (4b). or: the green area widest posteriorly, reaching to the phalias. hindmargin; hindwing with three red spots separate from the cell. 2: forewing slightly transparent at the apex: cell-spot very large; the spot before the 1. median much larger than the preceding one; band of the hindwing very broad, pale on the inner side. Colombia: Magdalena Valley and Cordillera of Bogotá. --elatos R. & J. core the green area smaller than in the preceding subspecies; hindwing with three small elatos. red spots. Cauca Valley. - calogyna R. & J. (4b). 3: forewing exteriorly somewhat more thickly scaled calogyna. than in phalias and elatos, usually a white spot before the 2. median; hindwing with 3 small red spots, close together. 2: the spot before the 1. median of the forewing larger than the preceding one; band of the hindwing bright red, its inner margin usually white. West Ecuador and west coast of Colombia. teneates R. & J. J. : the green area narrow, separated from the cell, usually enclosing one or two white teneates. spots. ² not known with certainty. North Venezuela and North Colombia.

P. anchises. Apex of the forewing distinctly, though only slightly, transparent. σ : tibiae and 1. segment of the tarsi thickened and covered with fine hairs; hindwing blue, strongly iridescent. 2: the spot before the 1. median larger than the preceding spot. Colombia to South Brazil and Paraguay. The black-brown larva has on the first and on the penultimate segment two dorsal spots, and on each of the thoracic segments and the S. and 9. abdominals one lateral spot; on the 6. and 7. segments is an oblique lateral band, sometimes broken up into spots. The dorsal humps on the pupa are three-edged and rather small. — alyattes Fldr. (4b, c). or: the green area separate from the cell, enclosing at least one white alyattes. spot, placed before the 2. median, many specimens with a second spot before the 1. median; the last spot on the inner surface of the hindwing larger than in P. iphidamas phalias. 2: cell-spot narrow; band of the hindwing entering the end of the cell, black outer margin wider than in iphidamas. Colombia, in the Magdalena Valley and probably on both sides of the Cordillera of Bogotá. - serapis Boisd. or: the green serapis. area very long and narrow, only a little wider posteriorly than anteriorly; band of the hindwing consisting of at least five spots. φ : cell-spot large, almost triangular, the spot before the 1. median very large and the band on the hindwing very broad. North Colombia. The distribution of *serapis* and *algattes* is only very imperfectly known. — **osyris** *Fldr.* (= xenares *Fldr.*, toxaris *Fldr.*, severus *Fldr.*) (4b). σ : the green *osyris*. \Box area of the forewing and the band of the hindwing broader than in serapis. 9: the cell-spot usually extending transversely across the cell; the band of the hindwing very little paler internally than externally. Venezuela. - cymochles Doubl. (= anacharsis Fldr.). J: forewing with one to three spots; hindwing cymochles. with three, occasionally four, red spots. 9: spots of the forewing purer white than in the preceding subspecies; cell-spot small; band of the hindwing almost unicolorous red, broadest in the middle. Trinidad, Paria Peninsula and Orinoco. - anchises L. (= telmosis Bates, toxaris Fldr.) (4 c). 3: green area narrow, anchises. sometimes wanting; hindwing more strongly dentate than in the other forms, the red spots usually widely separated. 2: forewing without cell-spot or with merely a cell-streak, often without any spots; hindwing with a row of six or seven red spots, separated from one another. Dutch and French Guiana. - thelios thelios. Gray (= hierocles Gray, aglaope Gray [partim]) (5 a). ♂: the green area triangular, enclosing one or two rather large white spots; hindwing with three or four red spots, of which the one before the 2. median is the largest. 2: forewing with at least two white spots, the one before the 2. median the largest; hindwing with seven or eight separated spots. Lower Amazon, from Pará to Santarem; occurs in dry, sandy places in the forest, not in the swamps. — etias k. & J. σ : palpi sometimes almost without red scales; hindwing *etias*. without a red spot before the 1. radial, or this spot very small. \Im : spots on the forewing pure white, cellspot very small, two large white spots before and behind the 1. median. East Bolivia, found by J. STEINBACH in December, January and April-May. — orbignyanus Luc. (4 c). The red band on the hindwing of the σ orbignyanus. is uniformly curved and becomes gradually narrower anteriorly; the forewing has at least one large white spot. In the $\hat{\varphi}$ a spot in the cell of the forewing and at least two on the disc; hindwing with a band from

PAPILIO. By Dr. K. JORDAN.

the subcostal to the hindmargin. Paraguay; northern part of Entre Rios; Matto Grosso; Govaz. foetterlei. foetterlei R. & J. (4c). White spots on the forewing of both sexes very large and the band on the hindwing very broad. In the interior of the province of S o Paulo.

P. hedae Foett. (5 a). Only one 2 known; palpi red; on the forewing a very broad white band, hedae. with the edges diffuse; hindwing for the most part pale red, whitish towards the base, the marginal spots slightly yellowish. Icarahy, near Rio de Janeiro.

P. nephalion Godt. (= osymanduas Hbn., proteus Boisd., stilbon Koll., haemon Fldr) (4d, 2d). nephalion. Marginal tooth at the 3. radial of the hindwing projecting more than in P. anchises L. Forewing in both sexes with two or three large white spots. Hindwing of the σ^2 with three red spots on the upper surface, and usually a fourth separated from them; in the φ with a band composed of five spots, and commonly a sixth or even a seventh (very small) spot. The larva is brown-black, with a yellow longitudinal stripe on the sides. The butterfly is not rare, and occurs in Brazil proper southwards to Rio Grande do Sul, as well as in Matto Grosso. Paraguay and the adjoining parts of Argentina. A forest-species.

Lysander-Group.

The following species, which form the *lysander*-group, have red instead of white marginal spots. The hind tibiae of the σ^2 are always dilated and with fine hairs. The species occur together with those of the *aeneas*-group, and are sometimes very common. The red spots on the hindwing have no opalescent gloss.

P. panthonus. Forewing in both sexes black, with reddish marginal spots; hindwing with a regularly curved row of separated red spots. Scent-wool white. Guiana and Brazil, in two subspecies. numa, numa Boisd. (= jaguarae Foett.), from Brazil (São Paulo and Minas Geraës), has small, widely separated panthonus. spots. — In panthonus Cr. (3b, 5a), from the three Guianas, the spots on the hindwing are somewhat larger. This form most probably occurs also on the north side of the Lower Amazon.

P. aglaope Gray. σ^2 : forewing with a blue-green band, which has at least one large white spot. placed before the 2. median; hindwing with four spots, separate from the cell. The 2 occurs in two forms: lysimachus, 9-f. lysimachus Honr. has on the forewing a straight row of three spots; 9-f. callicles Bates has on the callicles forewing a large spot behind the 1. median, a smaller one before it, and a streak in the cell. - This species is rather rare; it has hitherto only been taken on the Lower Amazon, in South-east Peru and in euristeus, eastern Bolivia. — CRAMER has figured as euristeus a butterfly from Surinam which perhaps also belongs of here, but the figure is too bad to be referred with certainty to any one species. Is it the σ^2 of klagesi Ehrm?

P. lysander Cr. (= phrynichus *Fldr.*). \bigcirc with white scent-wool in the fold of the hindwing. Outer lysander. margin of the forewing in the 2 rounded; the last two red spots on the hindwing separated, standing parsodes. obliquely one under the other; 2-f. parsodes Gray (= sonoria Gray) has a large white area on the arbates, forewing, composed of several spots; in the 9-f. arbates Stoll (= anaximenes Fldr.) the forewing has only brissonius, one white spot; whilst in the &-f. brissonius Gray (5b) the forewing has no white spot at all. A \circ ² with bari, vellow instead of red spots on the forewing has been described as ab. bari Oberth. - This species is known from the whole of the Amazon, East Peru and East Ecuador, as well as from the Guianas and Bogotá; it has not hitherto been found in Bohvia nor in Brazil proper.

P. echemon resembles the preceding species; but the forewing is narrower, the outer margin being incurved in the σ , straight in the ϑ , the cell of the forewing is narrower at its extremity, the 3. radial of the hindwing is usually much nearer to the 2. radial than to the 1. median, and the fold of the hindwing in the o⁷ has no white wool. On the Lower and Middle Amazon and in the Guianas. Two subspecies. echemon. HÜBNER'S figures agree with the form from the Amazon: in the or echemon Hbn. (= echelus Hbn.) the blue-green band of the forewing is narrow and placed, like the white band of the $\hat{\varphi}$, separate from the cell. ergeteles. From Pará to Santarem. - ergeteles Gray (= echephron Bates, echion Bates, polyphron Fldr.) has in the σ^{3} a broader blue-green band, and in the φ the white spot before the 2. median is contiguous to the cell, or the forewing is without spots. \Im -f. ergeteles Gray is the form of the \Im with a white area; in the \Im -f. pisander. pisander Fldr. the white spots are only indicated by a few white scales. From Obidos to the Rio Negro, north side of the Amazon; Guiana. — Whilst P. lysander is a swamp species and flies heavily over the wettest places in the shade of the woods, P. echemon prefers drier localities in the woods, and is often found on the flowers which hang down from the trees over the narrow paths in the forests.

P. neophilus. In the σ the cell of the hindwing on the upper surface is red nearly to the base. In both sexes the 2. median of the hindwing arises at the same height as the subcostal. Colombia to Paraguav and South Brazil, but not from Rio de Janeiro to Pernambuco, where P. zacynthus occurs. -eurybates. eurybates Gray (= euphales Gray) (5 c). σ with large white spots on the forewing; the red spots on the hindwing not blackish towards the base, with the exception of the first and last, the middle ones touching the cell on the under surface. 2 with 2 white spots between the 3. radial and 2. median, rarely with the spots merely indicated, the red band on the hindwing broad. São Paulo and Matto Grosso; Paraguay

aglaope.

(transition to the next form). — consus R. & J. σ^* : the green area between the 2. median longer than consus. broad, the white spot before the 2. median rounded, usually smaller than the preceding spot; on the hindwing the cell-spot and the part of the discal spot next to the cell are blackish red; the spots on the underside smaller than in eurybates. In the \Im the white spots are large; the band on the hindwing is usually separate from the cell. East Bolivia. - olivencius Bates (5 c). White spots on the forewing in olivencius. both sexes small or indistinct; the red spots on the hindwing in the σ long on the upper surface, short on the under. In the 2-ab. anaximenes *Fldr*, the spots of the hindwing are very long. East Peru to the anaximenes. Cordillera of Bogotá, and on the Amazon downwards to the Rio Negro. - ecbolius R. & J. J. : the green ecbolius, e spot behind the 2. median of the forewing about as long as broad, the white spot before this vein distinct and transverse as the preceding spot; the red spots on the hindwing shorter than in *olivencius*. In the \mathfrak{P} the forewing has a large white spot before the 2. median and another before the 1. median, the outer margin of these spots almost parallel with the outer margin of the wing. Lower Amazon, upwards to Obidos. - neophilus Hbn. (= gargasus Hbn. [partim], aeneides Esp. [partim]), the first described form, neophilus. inhabits the Guianas. σ : the green area is broader and the red spots on the underside of the hindwing smaller than in the σ^2 of *ecbolius*. In the γ there are no white spots on the forewing, or they are small, rarely are they large; the third spot on the hindwing longer than the others, the spots on the upper surface further from the margin than in olivencius. - parianus R. & J. from Trinidad, Cumana and the Orinoco. parianus. The green area of the σ^2 behind the 2. median longer than it is broad, enclosing three white spots; the spots on the under surface of the hindwing paler than in the Bolivian form, to which parianus comes near, the spot before the 2. median placed close to the cell. In the \mathfrak{P} the band of the hindwing is somewhat more curved than in the other subspecies; the narrow middle spots are placed close to the cell on both surfaces.

P. zacynthus. Band on the forewing in the σ greenish blue. The spots on the under surface of the hindwing of the 2 paler than in P. neophilus. Brazil, from Rio de Janeiro northwards, in two geographical forms. Not rare in damp localities overgrown with bushes. The larva is grey-brown, with a yellow lateral stripe. — The form from the province of Rio de Janeiro, zacynthus F. (5 b), occurs in the zacynthus. neighbourhood of the town of Rio, but is much rarer than P. nephalion. The forewing is not transparent at the apex; the \mathcal{L} has a spot in the cell of the forewing. — The northern form, from Pernambuco, Bahia and Rio Tapajos, is polymetus Godt. (5b). The forewing is transparent at the apex and the φ has no spot polymetus. in the cell, or only a very small one.

P. arcas. In the σ ⁷ the cell of the hindwing above is red from about the middle; in the φ the forewing has a large white spot placed obliquely across the cell. Mexico to the Guianas and Colombia, not found further south. - mylotes Bates (= docimus Gray, caleli Reak., tonila Reak., alcamedes Fldr., mylotes. aristomenes F/dr.) (5 d). σ^2 : the green spot before the 1. median long and usually enclosing a white spot; the cell mostly also with a white or green spot, no green streak at the hindmargin. The band on the hindwing in the 2 separate from the cell and bright red on both surfaces. Mexico to Costa Rica; very common in the lowlands. - mycale Godm. & Sulv., from Panama and the small islands on the Pacific coast mycale. of that Republic, forms a transition from the preceding to the following form. In the σ^2 the green area before the 2. median is always large; the cell-spot on the hindwing and the adjoining parts of the discal spot are tinged with brown. The band on the hindwing of the \mathfrak{P} is bright red and usually placed close to the cell. - arriphus Boisd. The forewing of the of has almost always a green spot also before the arriphus. 1. median; hindwing with a cell-spot on the upper surface, the band sometimes pale and narrow: J-ab. agathokles Koll. In the 2 the band on the hindwing is pale red and includes also the extremity of the agathokles. cell. Colombia, from the Rio Magdalena and Rio Meta; common in "Bogotá" collections. - antheas antheas. R. & J. The green band of the or reduced, no spot before the 1. median; the band of the hindwing usually very pale, in the $\hat{\gamma}$ likewise paler than in arriphus and mostly shorter. Cauca Valley. — arcas Cr. arcas. – $(\sigma^2 = \text{eurimedes } Cr.)$ from Venezuela and Guiana. The red band of the hindwing in both sexes is broader than in the other subspecies; in the σ^2 the extremity of the cell of the hindwing is red also beneath, and in the 2 the cell-spot is much larger than in arriphus.

P. timias. Both sexes with two large white spots on the forewing, in the σ^2 placed in the green area; red cell-spot on the hindwing in the σ^2 large; φ with a rather small cell-spot or none at all. West Ecuador, from Guayaquil upwards. Many northern species occur in this district which are wanting in East Ecuador and Peru. — GRAY'S timias (5d), whose \hat{Y} was named bimaculatus by HEWITSON, occurs about timias. Guayaquil and in the neighbouring districts. The cell of the forewing in the σ^2 has no distinct green spot; the first spot on the under surface of the hindwing is at least as large as the last. In the 2 also there is no distinct cell-spot on the forewing and the discal spots are small. — potone R. & J. has in both sexes potone. a distinct cell-spot on the forewing. Paramba and Ambato, taken by ROSENBERG at a height of 3500 ft.

Section B.

The following Aristolochia-Papilios are very different from the preceding groups. The body is never spotted with bright red, and the wings never have bright red spots or bands. The antennae have no deep sensory grooves

PAPILIO. By Dr. K. JORDAN.

and their terminal segment is very short. The cell of the hindwing is rounded at the apex and its lower angle is at least as large as the upper. The scent-organ on the hindwing of the \bigcirc^3 is never woolly and the tibiae are never thickened. — The larva bears on the first thoracic segment strongly elongated fleshy protuberances, and the dorsal humps of the pupa are narrow, laterally compressed and rather long.

Polydamas-Group.

This *polydamas*-group also differs essentielly in habits from the red-spotted butterflies. They are inhabitants of the open country, seldom met with in the shade of the forest. The $\sigma^{\gamma}\sigma^{\gamma}$, which are quick fliers, are fond of resting on damp sand or mud to imbibe the moisture, whilst the \mathfrak{P} visit several common species of flowers.

P. philenor is a well-known North American butterfly, distinguished by the bright green or blue gloss of the outer part of the hindwing beneath. Its original home was undoubtedly the Southern Atlantic States, whence it has spread to Mexico and again in the west as far as Northern California. In the central part of the United States, from Colorado northwards, the species is absent; in the east, on the contrary, it extends as far as the south of Canada, where it is met with from time to time as an immigrant. Its distribution northwards, in places where the original food-plant (Aristolochia serpentaria) is not found, has orsua. been made possible by the cultivation of Aristolochia sipho as an ornamental plant. - orsua Godm. & Salv. philenor, is a small tailless form from the Tres Marias Islands with strongly glossy hindwing. - philenor L. (= astinous Drury) (6 a) inhabits the United States and Mexico. The species varies geographically but little, yet some of the Mexican specimens are tailless, which seems never to occur in North America. This acauda. ab. mex. acauda Oberth. (== nezahualcovotl Streck., corbis Godm. & Salv.) occurs together with ordinary wasmuthi, specimens. As ab. wasmuthi Weeks a colour variety is described which recalls the celebrated ab. calverleyi of P. polyxenes Fabr. In this aberration the marginal spots are enlarged into a broad band. Specimens obsoleta, without submarginal spots on the upper surface are ab. obsoleta Fhrm. The species has several generations in the Southern States. The specimens of the spring brood are in general more rough-haired than those of the summer. The butterfly is very common, and flies in great numbers about flowering trees, or sips at the flowers of low plants or at wayside pools. In feeding and flying the wings have a quivering motion as in the allied species.

devilliers. P. devilliers Godt. (6 a). Hitherto known with certainty only from Cuba; the older authors assigned it to Florida also, which is perhaps due to an error. Tailed. Forewing with a submarginal row of white spots; hindwing on the upper surface with a submarginal band, and on the under with one or more silver spots.

P. zetes Westw. (6a) has on the upper surface of both wings a yellowish band, and on the under zetes. surface of the hindwing a silver band. Haiti; only a few specimens in collections.

The following species are all without tails. To some extent the form of the wings recalls the socalled Ornithoptera from the Oriental Region.

P. streckerianus How. (= mathani Oberth.) (6a) is a native of the dry open country of North streikerianus. Peru. The spots on the body are greenish vellow. Forewing without band, the band on the hindwing very variable, opalescent in the \mathcal{Q} .

P. archidamas Boisd. (= bias Kirby, ex Roger) (6b). The spots on the body reddish. Upper surarchidamas. face of both wings with a band composed of spots; under surface of the hindwing for the most part dirty white. Chile; all the year round in the open coast districts. The earlier stages are very similar to those of P. polydamas.

P. polydamas. The spots on the body reddish; upper surface of both wings with a band composed of spots; under surface of the hindwing black-brown, with red or yellowish red submarginal spots. Distributed from Virginia to Argentina; varying but little geographically on the continent, on the Greater and Lesser Antilles on the contrary developed into a different form on almost every island. One of the commonest Papilios on the continent; an inhabitant of cultivated ground which accompanies the settler everywhere; it is especially common where the ground cleared for cultivation has been again neglected. The larva varies from brown-yellow to dark black-brown; the tubercles are long, in dark specimens red. The pupa is strongly vincentius, curved, and has three long, compressed humps on the abdomen; the thoracic horn is long. - vincentius R. & J. Above like the continental form; under surface of the hindwing with white costal streak; sublucianus. marginal spots large. St. Vincent. - lucianus R. & J. The band on the upper surface broad; under xenodamas. surface of the hindwing with costal streak at the base; submarginal spots large. St. Lucia. - xenodamas Hbn. (= cebriones Dalm., eurydamas Kirby, ex Roger). Band on the upper surface of the hindwing broad, placed close to the cell; under surface of the hindwing at the base with a large bluish grey spot and costal dominicus. streak. Martinique; formerly erroneously given as inhabiting Brazil. -- dominicus R. & J. The posterior spots on the upper surface of the forewing smaller than in *xenodamas*; band on the hindwing curved. Under neodamas. surface of the hindwing with costal streak, but without the large spot below it. Dominica. - neodamas Luc. The upper spots of the band of the forewing wanting or small, the hinder spots further from the antiquus. margin than in the preceding forms. Band on the hindwing almost straight. Guadeloupe. - antiquus

R. & J. Similar to the next form; the four anterior spots of the band of the forewing small; band on the hindwing narrower than in the next subspecies; submarginal spots on the under surface of the hindwing large, yellowish red. Antigua. — thyamus R. & J. Similar to polydamas; submarginal spots on the under thyamus. surface of the hindwing much more yellowish than in the continental subspecies. St. Thomas. — lucayus lucayus. R. & J. Under surface paler than in P. polydamas; the white transverse streak at the anal angle of the hindwing extending at least beyond the 2. median; the red submarginal spots as in the continental form, but larger. Bahamas. — polydamas L. (6b) is the continental form, which occurs from Georgia to polydamas. Argentina. It is also found on Cuba, but the Cuban specimens are usually distinguished by the deeper black marginal area on the under surface of the hindwing. The band on the upper surface varies much in breadth. The submarginal spots on the under surface of the 2. median on the preceding form on the upper surface principally polycrates. - in the more distal position of the spot before the 2. median on the hindwing, and on the under surface in the large silver spots which stand at some of the red ones. The harpe of the σ has only one tooth instead of the two of all the preceding forms. Haiti and probably Porto Rico. — jamaicensis R. & J. is jamaicensis. very similar to polycrates, but the submarginal spots on the under surface of the hindwing are larger and the silver spots connected with them smaller. Jamaica.

P. philetas *Hew.* (6b). Abdomen of the σ yellowish white above. Under surface of the hindwing *philetas*. greenish yellow, with red submarginal spots. South Ecuador and North Peru.

P. madyes. Similar to the previous species; submarginal spots on the under surface of the hindwing yellow. The scent-scales different in the geographical forms, which is also the case in some of the other species of the *polydamas*-group. Peru and Bolivia. — **plinius** *Weym.* from North Peru. Forewing above *plinius.* with four small spots. Hindwing beneath ochre yellow (discoloured?); submarginal spots small. Only one specimen known; found by STTBEL between Moyabamba and Chachapoyas. — **chlorodamas** *Guen.* (= marsyas *chlorodamas. Stgr.*), the commonest form in collections. Bands of spots on the upper surface broad, on the forewing while ($\sigma^{\dagger}\sigma^{\dagger}$, \mathfrak{A}) or yellow ($\sigma^{\dagger}\sigma^{\dagger}$). In Huánuco and Junin, East Peru. — **crispus** *R. & J.* Spots on the *crispus.* upper surface much smaller than in *chlorodamas*. South-East Peru. — **madyes** *Doubl.* Under surface of *madyes.* the hindwing streaked with black on the veins. Bolivia. — **tucumanus** *R. & J.* (6b), like *madyes*, but the *tucumanus.* apex of the forewing heneath not washed over with yellow; hindwing beneath smoky brown. Tucuman.

P. polystictus (= protodamas *auct*.). Forewing above with three to seven submarginal spots; hindwing with two rows of spots. Abdomen in the σ yellowish white above. Brazil, Argentina and Paraguay. Larva similar to that of *P. polydamas*; tubercles shorter, never red. Thoracic horn of the pupa long, inclined somewhat forwards, dorsum of the pupa behind the horn more or less suffused with yellow. Larva gregarious in its earlier stages. This common hutterfly flies in open spaces in the forest and on its horders, and is especially fond of feeding on the flowers of Lantana. The food-plant of the larva grows in woods and on the banks of rivers. — In **janira** *R. & J.* the spots on the upper surface are *janira*. large. Rio de Janeiro; Minas Geraës. — In **polystictus** *Btlr.* (6b) the spots are smaller and sometimes *polystictus*. partly obsolete. São Paulo to Rio Grande do Sul; Paraguay; Argentina.

P. eracon Godm. & Salv. (6 c). Forewing with a row of submarginal spots. Hindwing with a *eracon*. uniformly curved hand of spots, placed about midway between the cell and the outer margin. Under surface of the hindwing with red submarginal spots, each with a yellowish white dot at the outer side. West Mexico, hitherto only known from Colima and the province of Guerrero.

P. belus. Forewing of the σ without white spots on the upper surface; hindwing with one to seven white spots on the disc, the first of which is always large; the forewing of the \mathfrak{P} is similar to that of the σ^{3} or it has a large pale yellow area. Hindwing beneath in both sexes with white dots outside the red submarginal spets. The σ^2 is called by BATES a swift and hold flier; the \circ with yellow area on the forewing he found on flowers at the edge of the forest. The \mathfrak{P} of this, as also of the following species, are much more rarely caught than the 33. - chalceus R. & J., from the province of Guerrero, West chalceus. Mexico, has an almost straight band on the hindwing, and on the under surface there is before the subcostal nervure a red submarginal spot, which is wanting in the other subspecies. -- varus Koll. or: varus. hindwing with a band of spots diminishing in width posteriorly. The 2 occurs in two forms. The common form is 2-f. latinus Fldr., it is similar to the σ , but the forewing has some submarginal spots and the first latinus. spot of the hand of the hindwing is about as large as the second. The very rare form with large yellowish area on the forewing, occupying the extremity of the cell and the adjacent part of the disc, is 2-f. varus Koll. Distributed from Guatemala to North-East Ecuador and North Venezuela; the o' common in Bogotácollections. - belus Cr. (6 c) is the form which inhabits the Guianas, the Amazons, East Peru and Goyaz. belus. In the σ the hindwing has usually only one white spot, yet specimens occur which have a row of small spots in the disc. Two forms of the $\hat{\varphi}$ are known; $\hat{\varphi}$ -f. belus Cr. (= caburi Kuye) is similar to the σ and has on the hindwing either only one spot or a complete row; in ab. amulius Esp. the spots on the under amulius.

surface of the hindwing are vellow (only known from ESPER's and MARTYN's figures). The second variety amazonis. of the \mathfrak{P} is \mathfrak{P} -f. amazonis R. & J. (6c): it has a vellow area on the forewing like the \mathfrak{P} -f. varus of the subbelemus. species varus Koll. - belemus Bates from the south side of the Lower Amazon has a straight band on the cochabamba, hindwing; only the form of the 2 similar to the d is known. - cochabamba Weeks. d: hindwing usually with a broad straight macular band; sometimes the last five spots small, very rarely wanting. Scent-scales short as in the Mexican subspecies. The \mathfrak{P} is not known. South-East Peru; Bolivia.

P. laodamas. Similar to the preceding species. Hindwing above with a broad macular band; the red submarginal spots on the under surface narrow, not accompanied by white dots. The $\hat{\varphi}$ resembles the σ' , procas. but the middle spots on the hindwing are large, whilst the first is small. Mexico to Colombia. - procas Godm. & Salv. J: the band on the hindwing is usually contiguous to the cell or crosses its extremity, it iopas is rarely separated from the cell (ab. iopas Godm. & Salr.). 2: band on the hindwing usually occupying the extremity of the cell. West Mexico, known from the provinces of Michoacan, Jalisco and Guerrero. copanae. copanae Reak. (= chrysodamas Bates). Band on the hindwing in $\sigma^2 \mathfrak{p}$ separate from the cell; the red submarginal spots on the under surface of the hindwing narrower than in procas. Scent-scales longer than in rhipidius. the preceding form. East Mexico to Honduras. - rhipidius R. & J. Hindwing in both sexes with very large greenish white central area, which in the σ fills up the cell almost to the base, in the φ to the first laodamas, quarter. Costa Rica. - laodamas Fldr. (6d) is the best-known form, which is very common in Bogotacollections; it is known from the west coast, the Magdalena Valley and the Cordillera of Bogotá. The first spot on the band of the hindwing is very large and reaches almost to the base; it touches the cell, as do the next two or three spots. The \mathcal{P} is not known.

P. lycidas Cr. (= erymanthus Cr.) (6d) is easy to recognise by the white stripe before the hindlycidas. margin on the upper surface of the hindwing; this stripe is shorter in the \mathfrak{P} than in the σ^{γ} . — Guatemala to Bolivia and Pará. Appears not to vary geographically. There is only one form of the 2 known. The d occurs commonly at the edges of water-courses. Like the allied species the butterflies first fly a few times round the places where they are going to alight to drink, as if they wished to make sure of the absence of enemies; but they are not easily disturbed when once they have begun to drink.

P. crassus Cr. (6 d). A very long-winged species, distributed from Costa Rica to Rio de Janeiro. Forewing with white patches in and below the cell; hindwing with large white costal area, which in the σ *lepidus.* reaches to the base. In the σ -f. lepidus Fldr, the white patches on the upper surface of the forewing are wanting. -- The black-brown larva (probably variable in its ground-colour) has no spots. The thoracic hump of the pupa is very long and divided at the tip.

B. Fluted-Papilios.

Here belong the greatest part of the Swallowtail species. Although the forms have followed very different lines of development and often in their outward appearance have not preserved the slightest resemblance to one another, yet this apparently heterogeneous mixture of species is distinguished by sharply marked characters from the other two divisions of the Swallowtails, namely the Aristolochia-Papilios and the Kite-Papilios. The segments of the scaleless antennae are somewhat narrowed at the base; the fine sensory hairs are almost equally distributed over the ventral surface or confined to two large, non-impressed lateral areas. The tarsi are likewise not scaled; the dorsal spines of the segments are separated from the ventral spines by a spineless, impressed lateral space. The abdominal margin of the hindwing in both sexes is curved downwards, forming a kind of groove; a scent-organ is wanting on the hindwing. The tibiae of the of are never thickened nor covered with fine hairs. - The larva is either smooth, without humps, or the tubercles are hard and spiny, not fleshy. The third and fourth thoracic segments are enlarged, so that the larva appears thinner in front and behind. Many of the larvae bear on the thorax on both sides a sort of eye-spot and on the middle of the body a saddle-patch: Plants of very many families serve as food, partly herbs (Umbelliferae, Composites, etc.), but still more often the leaves of trees. - The pupa is wrinkled like leather and often resembles a piece of wood. The head is produced into two tubercles or is truncate, and the thorax bears a usually rather short horn. The wing-cases are expanded much less in mussel-shape than in the Aristolochia-Papilios. and the humps on the abdomen, if present at all, are very short.

The Fluted-Papilios occur in all tropical and temperate regions (New Zealand excepted), and extend northwards with one species as far as the arctic zone. They are therefore the most widely distributed division of the Swallowtails. In their habits they differ quite as much from one another as is their garb. Most species are good fliers, which if frightened hurry away in frantic haste. They almost all visit flowers, especially the o'o', and are fond of resting on damp sand or mud. Here their difference in character from the Aristolochia-Papilios becomes apparent, in that they do not crowd together in thick clusters, but rest singly round the outside of the crowd formed by Pierids and Kite-Papilios. Very many of the Fluted-Papilios wear the dress of other butterflies. In America Danaids. Heliconids, Pierids, and especially

22

crassus

PAPILIO. By Dr. K. Jobdan.

Aristolochia-Papilios serve as models. In some cases only the \mathfrak{P} , or one of the \mathfrak{P} -forms, is mimetic. Among the American Fluted-Papilios are found a number of powerfully built species with the costal margin of the forewing dentate. We find something similar in the $\mathfrak{T}\mathfrak{T}$ of the Indo-Australian Pierid genus *Prioneris*, and in the Nymphalid genera *Charaxes*, *Eulepis*, *Euxanthe* and *Palla*, which are all Old World insects. The dentition of the costal margin of these butterflies is evidently a phenomenon accompanying the strengthening of the margin, which is closely related to the acquisition of a strong flight.

Sexual dimorphism is very common among the Fluted-Papilios; as a rule one 2-form resembles the σ , whilst the other is mimetic. Sharply pronounced seasonal dimorphism is not observed among the American Fluted-Papilios, yet in the few North American forms which belong here, the butterflies which emerge from the hibernated pupae are generally smaller and more hairy than the summer brood, showing also slight differences in the markings. The trimorphism in both sexes of *P. polyxenes* and *P. bairdi* is very note-worthy.

Machaon-Group.

The species of the machaon-group have ringed larvae, which live on Umbelliferae, partly also on Artemisia.

P. polyxenes. Abdomen black, dotted with yellow. Palpi yellow. The posterior yellow spots of the discal band of the forewing remote from the cell, the discal band sometimes wanting. Geographically and individually very variable. The earlier stages very similar to those of P. machaon. The forms of North and Central America fly like P. machaon in cultivated districts, over meadows and fields covered with flowering fodder-plants, especially clover, at little distance from the ground. The South American forms only occur at considerable elevations. We have here the same phenomenon which we observe in Asia of P. machaon, which is likewise a high mountain species south of the Himalayas, in North-East India, Sikkim and Burma. — americus Koll. (= sadalus Luc.) occurs in three varieties. In the form melasina R. & J. americus. (8a) the vellow band on the wings is very much narrowed, sometimes reduced to a small spot, whilst in melasina. the true americus Koll, the hand is broad, especially on the hindwing; the pale yellow area on the underside of the hindwing not seldom reaches to the base. The black form lives especially in the Cauca Valley, Colombia, but also occurs elsewhere together with the ordinary form. Venezuela, Colombia, Ecuador and North Peru, occurring only at considerable heights, found up to about 3000 m. - stabilis R. & J., very stabilis. similar to the usual americus form, always with a broad yellow band, the last spot of the band of the forewing shorter than in americas, the band on the hindwing beneath sharply defined at the basal side. Costa Rica to Panama, common at a height of 1000 to 1300 m. - asterius Cr. (= asterias F.) is in some districts very variable, in others pretty constant. The σ^2 is much more variable than the \mathfrak{L} . We distinguish three principal forms of the σ , which are connected by intermediate stages and occur all three together in many districts. J-f. asterius Cr. has a macular band which traverses the extremity of the cell of the asterius. hindwing. Specimens with almost pure white spots on the upper surface are ab. semialba Ehrm. The o'-f. semialba. asterius occurs from New England to South Mexico. The second variety is J-f. curvifascia Skinn. from curvifascia. Mexico and Guatemala; in this the band of the hindwing is placed outside the cell and is almost uniformly curved. The most striking form is the o'-f. ampliata Mén. (= asterioides Reak.), in which the band is ampliata. broken up into small spots, which are often partly absent from the forewing. This black form is common in West Mexico, but also flies singly in East Mexico, and one specimen has been bred in Colorado. The **P** of asterius is much less variable. A few striking aberrations of both sexes have been named: in ab. calverleyi Grote the submarginal spots are very strongly enlarged and merged into a broad band; in ab. calverleyi. alunata Skinn. & Aur. on the contrary the submarginal spots on the hindwing are very small and bluish. - atunata. polyxenes F. (8a). The φ resembles the σ , the band of the hindwing is on the whole somewhat broader polyxenes. than in σ -f. asterius. Cuba. — brevicauda Saund. (= mediocauda Eimer). Sexes similar to one another, brevicauda. wings broad and short, outer margin of the forewing somewhat rounded. Inhabits Newfoundland, Anticosti and the districts adjoining the lower course and the estuary of the St. Lawrence River; June to August: the larva on parsley and other Umbelliferae near the coast and the river.

P. bairdi Edw. Either similar to P. machaon, but the anal ocellus with black pupil, or similar to P. polycenes, or standing between the two in its markings. These three forms, which occur together in Colorado, are: f. oregonia Edw. (= brucei Edw.) (8a), machaon-like, known from Colorado, Oregon, oregonia. Washington Territory, West Canada and British Columbia. The second form, which is known from Utah. Colorado and Arizona, is f. hollandi Edw.; the abdomen is machaon-like, whilst the wings resemble those hollandi. of the following form. In f. bairdi Edw. (= utahensis Streck.) (8a), which is found in Arizona, Colorado bairdi. and Utah, the black abdomen is spotted. The identity of the three forms has been established by breeding. Such non-seasonal trimorphism in both sexes is rare. The butterfly flies in Colorado together with P. polycenes asterius, and in Oregon and further north with P. zelicaon, but the insects are independent of one another. Whilst the larvae of the allied species feed on Umbelliferae, those of P. bairdi live on a Composite (Artemisia); the larvae of all these butterflies are very similar to one another.

PAPILIO. By Dr. K. Jordan.

nitra. P. nitra Edw. (8b). Wings shorter than in P. bairdi; very similar to f. bairdi; perhaps only a northern subspecies. — Known from Montana and West Canada; in the mountains in June and July.

zeticaon. P. zelicaon Luc. (= zolicaon Boisd.) (8b). The yellow discal area behind the 2. median of the forewing extending close to the cell; underside of the abdomen black, with or without an indication of yellow lines. — On the west coast a common insect, descending into the lowlands. From Arizona northwards to Alaska and eastwards to Colorado. Found up to a height of 3000 m. The larvae on Umbelliferae. coloro Wright is founded on an old, dark yellow coloured specimen.

P. indra. Thorax above anteriorly with yellowish lateral stripes. Spots on the wings whitish yellow, much paler than in the allied species; the size of the spots rather variable. — A western mountain species, which is difficult to catch; it occurs up to a height of 3500 m, and by preference inhabits rocky land, where the butterfly suns itself on the rocks. It does not frequent flowers and is a shy, swift flier. No satisfactory observations of the earlier stages have been made. The larva according to EbwARDS lives *indra*. on Artemisia. There are two subspecies. — The northern form with short tail is the true indra Reak. (8b); it occurs in Colorado, Nevada, Utah and northern California. — The form which flies in the mountains near pergamus. the coast of South California at 600 — 1000 m height is pergamus Edw.; it is distinguished by its long tail.

aliaska.

P. machaon. This Palaearctic species is represented in America by the subspecies **aliaska** *Scudd*. (= joannisi *Verity*) (8b). The black band on the hindwing is broader than in the geographically nearest subspecies *kamtschadalus*. *Aliaska* is rather common in July and August in Alaska, at the mouth of the River Yukon and on other rivers, as well as in the neighbourhood of lakes, probably everywhere in the lowlands where Umbelliferae grow. The insect is however still rare in European collections. Eastward *aliaska* occurs as far as Hudson's Bay.

Thoas-Group.

The following species of the thoas-group have all a spatulate tail. The larvae bear a saddle-spot before the middle and a large diffuse sidepatch on the last segments.

P. thoas. The spatulate tail has a yellow spot in the middle. The species occurs from Texas and the West Indian Islands southwards to Buenos Aires, but is wanting on the Lesser Antilles. It is everywhere common and tlies in the open country, in gardens and plantations. Those is a very bold flier, which metonius, often mounts high in the air. The larva lives on Piperaceae and Citrus. - melonius R. & J. is the subspecies from Jamaica; it has no cell-spot on the upper surface of the forewing. The reddish yellow spots oviedo. on the under surface of the hindwing are very large. - oviedo Gundl. (= epithoas Oberth.) occurs on Cuba. The upper surface of the forewing, and especially the under surface, are more extended yellow and autocles. have also a deeper tint than in the other subspecies. — autocles R. & J., occurring from Texas to nealces. Nicaragua, has no cell-spot; the yellow areas are pale. — nealces R. & J. is distributed from Nicaragua to North-West Ecuador and eastward to Trinidad and the Lower Orinoco. The forewing has always a cell-spot: the yellow tint is somewhat deeper than in autocles, but less deep than in the next subspecies; very common in Bogotá-collections. - thoas L. comes from the Guianas and the Lower Amazon. Deep cinyras. yellow; forewing with cell-spot, the first spot near the apex of the wing usually small. - cinyras Mén. is a large form, which inhabits the Middle and Lower Amazon and the eastern slopes of Ecuador, Peru and brasiliensis, Bolivia: the submarginal spots of the forewing are almost always absent. - brasiliensis R. & J. (7a), from Brazil, Paraguay and North Argentina, is often still larger than cinyras; the cell-spot of the forewing is absent or small, the first spot near the apex of the wing is mostly large and produced into a point. thoantiades. thoantiades Burm. occurs in Argentina, especially in the province of Buenos Aires. It is a small form, usually with narrow, pale yellow band.

homothoas. P. homothoas R. & J. (7 c). Tail shorter and more rounded at the tip than in the thoas-forms from South America; no cell-spot on the forewing. Genitalia quite different from the organs of P. thoas; instead of the long anal clasper of thoas there is a short fork, the teeth of which are curved right and left; harpe broad, rounded. Orinoco, Colombia, Marguerita Island off the coast of Venezuela.

cresphontes. P. cresphontes Cr. (7 a). Usually considered a slightly different variety of P. thoas. No cell-spot on the forewing; the fifth discal spot projecting further than the sixth. Claspers of the σ ' separate above, the anal hook quite short, the lower part of the anal segment likewise quite different from that of P. thoas; harpe broad, rounded. A common species in eastern North America, occurring as far as Costa Rica in the south and southern Canada in the north; but the insect is a wanderer, which is found only now and then in the northern districts. In the United States it does not extend westward beyond the Mississippi plain, except in the Southern States. Its true home is the region adjoining the Gulf of Mexico. It occurs also on Cuba. Publ. 30. X. 07.

V

PAPILIO. By Dr. K. JORDAN.

P. paeon. Sexes similar, as in the preceding species. Tail without yellow spot at the tip, the marginal spot behind the tail large. The larva on Pastinaca sativa and probably other Umbelliferae, resembling bird-droppings; thorax strongly swollen; in paler specimens the markings, which resemble those of the *thoas* and *cresphontes* larvae, scarcely visible. The pupa, in which stage the species remains about three weeks, is of the same shape as in the previous species. — In **thrason** *Fldr.*, from Colombia and North *thrason*. Venezuela, the marginal spot behind the tail is very long, extending to about the third quarter of the tail. — **paeon** *Boisd.* (7 c) is the southern form, in which the marginal spot only extends to the middle of *paeon*. Let the black marginal lines on the under surface of the hindwing broad, strongly curved between the veins. Ecnador, Peru and Bolivia: formerly (perhaps erroneously) recorded from Chile.

P. caiguanabus Poey (= numicus Hopf). (Sc). A species which has a peculiar appearance owing *caiguanabus* to the absence of the yellow discal bands and the enlargement of the submarginal spots. — Only on Cuba, rather rare, commoner in the eastern part of the island than in the western.

P. aristor *Godt.* (8d). From Haiti; the only known specimen (GODART's name-type, which was in aristor. the Paris Museum, seems to have been destroyed) is in the large collection of Mons. CHARLES OBERTHÜR; it was found near Port au Prince. Forewing with two rows of yellow spots; the discal row curved, not extending to the hindmargin, the outer row complete; hindwing with a row of yellow spots. Underside of the forewing with a yellow spot in the cell.

P. aristodemus. Wings marked similarly to those of *P. thoas*; cell of the forewing beneath quite yellow: tail black above, beneath with a yellow patch in the middle. Cuba, Haiti and Porto Rico; two subspecies. — temenes *Godt*. (7 c) is the form from Cuba; the yellow discal band is broad and the forewing *temenes*. has 5—7 submarginal spots. — In aristodemus *Esp.* (= daphnis *Gray*; cresphontinus *Kirby*), from Haiti and *aristodemus* Porto Rico, the discal band on the forewing is narrow and the row of 4 submarginal spots is strongly curved.

P. andraemon. An almost straight yellow band from the apex of the forewing to the middle of the hindwargin of the hindwing, a transverse area in the cell of the forewing and a short costal band outside the cell. Hindwing strongly dentate; tail with spot in the middle. The larva lives upon Citrus and Ruta: the second and third segments have a pale transverse band and the olive-brown segments 5-7 are laterally spotted with white, the 10 and 11 segments also bear white spots. — andraemon *Hbn.* (8b), andraemon. When occurs on Cuba, has no distinct submarginal spots on the upper surface of the forewing. — bonhotei bonhotei. — Sharpe is the form from the Bahamas, with pale markings and distinct submarginal spots on the upper surface of the forewing. — tailori. *E. & J.*, from Great Kayman, has no distinct cell-spot on the forewing.

P. machaonides *Esp.* (= lycoraeus *Godt.*) (9a) takes the place in Haiti of the preceding species, *machaonides.* which is wanting there. The discal band of the forewing is interrupted, the posterior part contiguous with the cell-spot, forming an oblique band. Nothing is known as to the habits of this beautiful insect. The negro republics of St. Domingo and Haiti are as good as closed against the white collector.

P. thersites F. (9a) is similar to the well known P. *lycophron IIbn.* In the σ ^{*} the yellow band *thersites.* \square on the forewing is very broad and the cell-spot very large. In the 2 the forewing has a curved yellow band. - Jamaica. The larva like that of P. *lycophron.*

P. ornythion Boisd. (7b). Forewing without cell-spot; discal band narrow; forewing beneath with ornythion. a row of narrow spots between the discal band and the submarginal spots. — Yucatan, West Mexico and Guatemala.

P. lycophron. Submarginal spots on the hindwing above and beneath large, hindwing beneath with a row of strongly curved reddish yellow crescents. The 2 occurs in two forms in many districts; it is always unlike the σ^2 . The larva, which lives on Citrus, is mottled with brown; the yellow lateral spots are large. Mexico to Argentina and South Brazil; several subspecies; is said to occur also on St. Lucia. — In pallas Gray the σ^2 has a discal band broken up into spots; the submarginal spots on the forewing are pallas. In the 2 the first or the first two submarginal spots are wanting; tail short; hindwing with three rows of spots. Mexico to Costa Rica. — hippomedon Fldr. (= theophron Fldr.). A small form with hippomedon. rounded hindwing; submarginal spots on the hindwing small; tail short. 2 not known. Colombia and North Venezuela. — phanias R. & J. Similar to the following subspecies; in the σ^2 the band on the forewing phanias. interrupted by broad black veins; submarginal spots of the hindwing above and of the forewing beneath smaller. 2 with strongly dentate hindwing; tail narrow, not spatulate; submarginal spots on the hindwing nearer to the margin than in the following form. East Ecuador to Bolivia and Goyaz. — lycophron IIbn. (= astyalus lycophron. Godt., mentor Dalm.) (8d) is the form from Brazil, Paraguay and Argentina, the commonest of all. In the σ^2 the veins intersecting the bands of the forewing are narrowly black and the submarginal spots on the under surface usually very large. The 2 in two forms: 2-f. oebalus Boisd. is grey-yellow posteriorly on oebalus. the forewing and from the base to the disc on the hindwing; 2-f. pirithous Boisd. (8d) has a black-brown pirithous. upper surface with a row of yellow submarginal spots.

25

4

P. androgeus. As in the preceding species the sexes are different and the 2 occurs in many districts in two forms. Tail narrow, pointed. Hindwing above with narrow bluish submarginal crescents, beneath with a regular row of reddish yellow crescents between cell and outer margin. Larva on Citrus; similar to that of P. lycophron; as in that species the pupa has on the upperside of the abdomen two rows of small tubercles. The butterfly is common in the open country, in gardens and at the edges of woods. epidaurus. West Indies and Mexico southwards to Paraguay and South Brazil. - epidaurus Godm. & Salv, occurs on Cuba, Haiti and St. Lucia and also inhabits Central America from Mexico to Panama. o⁷: the vellow area very broad: 2: forewing with indications of a yellow band outside the cell; the grey-blue scaling on the and rogeus. hindwing dense. — and rogeus Cr. (σ^2 = policaon Cr.) (10 a). σ^2 : the yellow area less pale than in the following subspecies. \mathcal{Q} in two forms: \mathcal{Q} -f. and rogeus Cr. (10a) has on the forewing two large vellow piranthus. patches, sometimes also a small spot; in the 2-f. piranthus Cr. these spots are wanting or are merely indicated, the metallic scaling of the hindwing is not dense and extends into the cell. From Colombia to laodocus. Bolivia, Matto Grosso and Pará. — laodocus F. (10a) inhabits Brazil proper, southwards to Paraná. The yellow area of the σ is pale, the small spots placed before the extremity of the cell are smaller and often entirely wanting. Only one \mathfrak{P} -f. known; this is similar to the \mathfrak{P} -f. and rogens of the preceding subspecies, but the upper yellow spot is smaller than the second.

Glaucus-Group.

The following species of the *glaucus*-group, with the exception of *P. pilumnus*, have in the hindwing a broad, strongly asymmetrical cell. The abdomen is striped longitudinally, not spotted. On the forewing the marginal band is connected with the 5. transverse band by a costal hook-shaped spot, whilst on the tailed hindwing a band running along the hindmargin forms a large V with the median band. The larva has an eye-spot on each side of the 3. thoracic segment and on the 4. segment a black transverse dorsal line, which, however, is wanting in *pilumnus*. The eggs are laid singly on leaves. The larva spins on the upper side of a leaf a silk cushion on which it rests. The edges of the leaf are more or less bent together by the threads. — The species occur in North America and Maryia. America and Mexico, and inhabit the open country.

P. glaucus. The subapical hook-mark of the forewing is yellow in the middle, black at the edges; hindwing beneath more or less orange proximally to the black postdiscal line. The φ occurs in two forms, with the exception of the northern districts. Larva polyphagous, especially frequent on Rosaceae, lime, birch, ash, etc., in the North one generation, in the Middle States two and in the South three generations. The buttertly is very common; it visits flowers, and is also fond of feeding on putrid or strongly smelling substances. The motion up and down is rather swift, and when the insect is frightened and takes to flight, it hurries away with violent flapping of the wings in an irregular zigzag course. Two geographical forms. canadensis. canadensis R. & J. is a small form with broad black hindmarginal band on the hindwing; the yellow submarginal spots on the under surface of the forewing form a continuous line. From Newfoundland to Alaska and southwards to New England. — glaucus L. (σ^2 = turnus L., antilochus L., australis Mayn.). The black abdominal margin of the hindwing narrower than the interspace between it and the cell; the 3. black band on the forewing on the whole shorter than in the northern form. The \mathfrak{P} is dimorphic. Intermediate specimens r_{turnus} are rare. The \mathfrak{P} resembling the σ is \mathfrak{P} -f. turnus L. (9b); in the second form the ground-colour is brown-black e glaucus, and the bands consequently stand out only very faintly: ²-f. glaucus (9a). From southern New England fletcheri, to Florida and the Mississippi Plain. To" with enlarged irregular black markings are the ab. fletcheri Kemp.

√ rutulus. P. rutulus Luc. (9b). Forewing more pointed than in glaucus, the hook-mark much less scaled with yellow; hindwing without orange spot proximally to the black postdiscal line. Harpe of the or with ammoni. simple dorsal hook and the apex of the harpe dorsally to the apical spine not rounded. ab. ammoni varizonensis. Behrens is founded upon dark yellow specimens (turned yellow?) from Nevada, and ab. arizonensis Edw. refers to specimens with broad black bands. - The larva lives upon willow, it is very similar to that of glaucus, but the thoracic spot is more oblong. The insect is an inhabitant of the west side of the continent, where it occurs from British Columbia to Arizona and Colorado. It is there fully as common as glaucus in the east and is chiefly found at the lower levels, although it also occurs in the mountains.

P. daunus Boisd. (= multicaudata Kirby) (9 c). An extremely variable species both in the extent daunus. of the black bands and in individual size. Hindwing more strongly dentate than in the preceding species. The tooth behind the tail nearly always prolonged to a short pointed tail. The hook-mark on the forewing is always scaled with yellow along the centre, the bands are narrower than in *rutulus*, the 4. black band of the forewing is narrower than the apical yellow cell-space. Southern specimens are on the whole larger than northern ones. - Larva on Rosaceae, very similar to that of glaucus. The insect occurs from British Columbia and Alberta southwards to Guatemala; it is a species of the mountainous and prairielike districts, which speeds along in swift, untiring flight, without stopping at flowers.

P. eurymedon Luc. (= lewisi Kirby, arizonensis Wright) (9c). Ground-colour paler than in the eurymedon. allied forms, the black bands broad; the hook-mark on the forewing not filled up with yellowish white

26

either above or beneath. Dorsal hook of the harpe of the \bigcirc^3 shorter than in the allied species. Specimens occur sometimes in high mountains in which the marginal band of the forewing in the middle is about as broad as the yellowish white discal area, they are f. mont. **albanus** *Fldr.* — Larva on Rhamnus californica: *albanus*. the 3. and 4. segment above with small ring-spot, the black and yellow transverse dorsal line posteriorly on the 4. segment rather broad. A common mountain species, distributed from British Columbia to Colorado. The butterfly visits flowers. especially thistles and mint, and frequently drinks at puddles in large numbers. Its flight is swift and agile.

P. alexiares. A broad-banded Mexican buttertly. The distal margin of the forewing is straight or very feebly concave: the hook-mark on the underside centred with yellow and this yellowish scaling continuous with the grey or yellowish line situated on the black postdiscal band. On the disc of the hindwing beneath more or less large orange-coloured patches. Early stages not known. Eastern Mexico; two subspecies. — garcia R. & J. (9b). Yellowish apical cell-area about as broad as the black band placed garcia. at its distal side. The black marginal band not broader in the middle than the yellow discal band; the yellow submarginal spots on the under surface of the hindwing narrow, more or less distinctly separated from one another. Monterey, province of Nuevo Leon. — alexiares Hopf. The yellow parts more or less alexiares. dusted over with black, the black bands broader than in garcia, the posterior yellow submarginal spots are wanting on the upper surface of the forewing, whilst the submarginal spots on the under surface form a rather broad continuous band. Cuesta de Misantla, in Vera Cruz.

P. pilumnus Boisd. (9 c). A less specialised form than the preceding ones. Cell of the hindwing *pilumnus*. A almost symmetrical, tibiae and tarsi pale greenish. Hindwing above with 2 sharply defined orange spots; the proximal arm of the large V of the hindwing on the under surface divided longitudinally by a grey line. — The larva recalls that of *troilus*. The insect occurs in the open, high-lying Savannas of Arizona and Mexico southwards to Guatemala.

The two following species, *troilus* and *palamedes*, like the preceding forms, are Nearctic and form the transition to the mimetic *anchisiades*-group, which they approach rather closely in the early stages and in structure.

P. troilus. Black; thorax and abdomen with small yellowish spots; both wings with a row of submarginal spots, those on the forewing smaller in the 2 than in the σ ; hindwing with bluish grey-green discal area. On the under surface the hindwing has a discal and a submarginal row of orange-coloured spots and distally to the discal row large metallic blue spots. The larva has a large eye-spot on each side of the 3. thoracic segment and large blind spots on the 4. It lives on the upper side of a leaf in a tube which is formed by the edge of the leaf being so strongly bent over to the middle rib that it comes to lie close against the upper surface. It is mostly found on sassafras and benzoin, Lauraceae, but also lives on other plants, as Magnolia, Prunus, Pirus, etc. Hibernates as pupa. Two broods. The butterfly usually hovers only a few feet above the ground, flying nimbly in quest of the flowers on which it feeds. Canada to Florida and Texas. — In troilus L. (= ilioneus Abb. & Smith) (8 c) the submarginal spots on the under-*troilus*. ϕ side of the hindwing are bluish grey-green. Canada to Georgia and Texas, westward as far as the foot of the Rocky Mountains. In ab. radiatus Streck. the submarginal spots of the hindwing on the upperside are *radiatus*. enlarged to longitudinal stripes. Specimens also occur in which the submarginal spots than the preceding sub-*texanus*. species; many specimens have a pale subbasal band on the under surface. Florida; Texas (?).

P. palamedes. Antenna brown; tibiae and tarsi green; abdomen striped with yellow. Markings on the underside of the wings pale yellow; 2 rows of spots on the forewing besides the marginal spots, the discal row doubled towards the costa; on the hindwing a discal band and a row of submarginal spots, and in addition, especially in the 2, blue spots are present outside the discal band. On the under surface the hindwing has a narrow subbasal band and the discal band is dentate and more or less orange like the submarginal spots. The larva is very similar to that of *troilus* and has the same habits. On Magnolia. The butterfly is common in Florida in the spring. Distributed from Virginia southwards as far as North-East Mexico. The 2 is more brownish black than the σ^2 . — **palamedes** Drury (= chalcas F, chalcus F, flavo- palamedes. I maculatus Goeze). The discal spots of the forewing are large, the cell has nearly always a spot. Virginia to South Florida and Texas, yet also found even in Nebraska. — **leontis** R. & J. (8c). A small form with *leontis*. reduced discal spots; forewing without cell-spot on the upperside or with only a very narrow streak. Monterey, province of Nuevo Leon, Mexico. (On pl. 8 the name is erroneously printed *leontia*.)

Anchisiades-Group.

In the species of the *anchisiades*-group the pronotum and thorax are at least partly spotted with red or yellow-red. The abdomen is black and has no light markings except a basal lateral spot and streak. The cell of the forewing beneath is not streaked with yellow and the hindwing has no blue spots. The larvae, so far as is

PAPILIO. By Dr. K. JORDAN.

known, are marmorated; the light colour forms before the middle, especially laterally, a large irregular spot; on each side a subdorsal row of tubercles. The larvae are shiny and superficially resemble those of Tenthredinidae; they rest in larger numbers on leaves or the trunk and are mostly found on Citrus. Pupa resembling a short broken-off twig; the thoracic horn not long.

P. hyppason Cr. (= hippason Esp.) (10 b, c). Tailless. Pronotum spotted with red. Hindwing beneath with red basal spot behind the cell. Subcostal of the hindwing much more proximal than the hyppason. 2. median. Sexes different from one another, each variable in itself. \mathcal{O} -f. hyppason Cr. (= hippasonides ptilion. Grose-Smith) has a broad band on the forewing, mostly abbreviated. In \mathcal{O} -f. ptilion R. & J the band of the forewing is narrow and placed farther from the cell. The \mathfrak{P} occurs likewise in 2 principal forms: \mathfrak{P} -f. amosis amosis Cr. has a black forewing, on which scarcely a trace of white discal spots is visible. In Q-f. paraensis. paraensis Bates, on the contrary, the forewing has one or several white or yellowish white spots. These forms occur together, though not everywhere. - The Guianas to Pará, the Amazon upwards to Peru and southwards to South-East Bolivia; not known from Brazil proper, Ecuador, Venezuela and Colombia. The butterfly is found at the edges of swampy woods and has a swift flight.

P. pelaus. With spatulate tail. Sexes similar, but the markings in the 2 somewhat enlarged and on the hindwing more numerous than in the σ^{\dagger} . Black, forewing with oblique white band from the costa to the anal angle; hindwing with complete (\mathcal{G}) or incomplete (\mathcal{G}) row of pale red submarginal spots; beneath there are usually also small discal spots present, which sometimes in the $\hat{\varphi}$ also occur above. West pelaus. Indies. - pelaus F. (= ornofagus Weidem., peleus Gmel.) (7b) has a proportionately broad white band on the forewing, which above, at least in the \mathcal{P} , also enters the extremity of the cell. Jamaica and Cuba; imerius. perhaps the specimens from Porto Rico also belong here. — In imerius Godt. (= augias Mén.) the band of the forewing is narrower anteriorly, on the other hand its last spot is on the whole broader than in the preceding form, and the spots on the hindwing are smaller. Haiti.

- oxynius. **P. oxynius** *Hbn.* (= augustus *Boisd.*) (10 b). Similar to *pelaus*, but the band of the forewing only indicated; the marginal spots of both wings large. — Only known from Cuba. Larva on Xanthoxylum, gregarious by day, resting on the trunk and branches.
- epenetus. **P. epenetus** Hew. (10b). Tailless; the 2 paler than the σ ; forewing without spots except at the margin; hindwing with large yellowish white marginal spots and in the $\mathfrak L$ usually also some small discal spots. - From Western Ecuador, not known from the east side of the Andes. HAENSCH found the larvae in June in large numbers on Citrus.
- chiansiades. P. chiansiades Westw. (= chinsiades Kirby) (10 d). On the upper surface of the forewing before the hindmargin a large yellowish white spot; on the hindwing posteriorly some red discal and submarginal spots, the spots of the two rows separated from one another; the tooth of the 3. radial prolonged into a short pointed tail. The 2 and the earlier stages not known. - Eastern slopes of the Andes of Ecuador and Peru, likewise on the Upper Amazon.
- pharnaces. P. pharnaces Doubl. (= phanostratus Godm. & Salv., polycharmus iid.) (10c). More or less distinctly tailed, hindwing with two separated rows of red spots, the proximal spots in the σ often very small. Mexico, distributed from the Atlantic to the Pacific.
- **P. erostratus** Wester. (= herostratus Fldr., φ = rhetus Gray) (10 c). Like the preceding species, erostratus. but in the σ the spots on the upper surface of the hindwing yellowish white. In the φ the spots red also above, larger than in the \Im of *pharmaces*, the marginal spots of both wings also somewhat larger than in the foregoing species. Tail long and narrow. - Guerrero in West Mexico (where pharnaces also occurs), Guatemala and British Honduras. Commonest in hilly country at a height of about 5000 ft.
 - P. rogeri Boisd. Forewing lighter in colour from the apex of the cell outwards, the dark basal rogeri. area rounded distally; hindwing with suggestion of a small tail; some red spots on the disc, in two separate rows, in the σ the proximal spots very small, usually only indicated; in the \mathfrak{P} all the spots larger than in the J. - Larva not known. Yucatan and British Honduras.

P. anchisiades. A widely distributed variable species. Hindwing posteriorly somewhat prolonged, therefore more or less triangular; the tail is wanting or is only somewhat longer than the other marginal teeth, yet in the 2 sometimes as long and pointed as in the following species. The red spots of both the rows of the hindwing on the underside partly contiguous, or at least two pairs placed quite close together. Larva on Citrus, often resting together in hundreds on the stems. A very common insect, which is fond idaeus. of drinking at moist places on the banks of rivers; not a forest species. - idaeus F. (= pandion Fldr., pandonius Stgr.). Forewing usually with a distinct white spot at the end of the cell above and beneath or anduisiades. only beneath. Central America, from Mexico to Panama. - anchisiades Esp. (= anchises L. partim, theramenes Fldr., pompeius Kirby) (10 d). Very variable. Forewing with two white spots posteriorly of

PAPILIO. By Dr. K. Jordan.

the 1. median vein, either on both sides or only beneath, on the underside also a spot before the 1. median, rarely present above, and sometimes one before the 3. radial. In other specimens the white spots are wanting above: the forewing is dark from the base to the apex of the cell and then paler, and has a row of white spots beneath. From Colombia to Pará and Bolivia. — **capys** *Hbn.* (— evander *Godt.*) (10 c). *capys.* Forewing without white spots on the upperside; the disc paler, the dark proximal area rounded; on the underside a row of white spots, one of which is placed in the cell. East Bolivia, North Argentina, Paraguay and Brazil.

P. isidorus. Forewing on the under surface either without white cell-spot, or the spot small, not extending transversely across the cell. Hindwing posteriorly shorter than in *anchisiades*, the tail short. narrow; the last submarginal spot more distal than the large spot placed before it. The harpe of the σ'' not dentate. Larva not known. Panama to Bolivia; a species of the Andes. — **chironis** R. & J. Fore-*duronis*. wing above with 2 white spots between the 2. radial and 2. median and a small cell-spot; the spots beneath much larger, the spot between the 3. radial and 1. median the largest. Chiriqui. — **brises** R. & J. Fore-*brises*. If the Magdalena and Cauca Valleys. — **flavescens** Oberth. The white spots on the underside of the *flavescens*. If forewing reduced. The spot placed between the 2. and 3. radial of the hindwing usually white above or beneath or on both sides. East side of the Andes of Colombia, Ecuador and North Peru. — **isidorus** Doubl. isidorus. (10d). The white patch on the under surface of the forewing usually enters the cell and is often also indicated above; the red spots of the hindwing on the whole larger than in red-spotted specimens of *flarescens*, the two spots placed between the 2. radial and 2. median separated also on the upper surface. Eastern slopes of the Andes of Bolivia and Peru, northwards to Huánuco.

P. rhodostictus. Differs from *isidorus* chiefly in that the white cell-spot of the forewing at least beneath extends across the cell. the spots on the upper surface of the hindwing are merged in pairs into 3 or more rarely 2 large patches, and the harpe of the σ is almost symmetrical. Costa Rica to Ecuador. Larva not known. — **rhodostictus** *Bin*. & *Druce* (10d), from Costa Rica and Chiriqui, has a *rhodostictus*. narrow cell-spot and the discal spot placed before the 3. radial is the largest or the most clearly developed. — **pacificus** *R*. & *J*. The discal spot between the 3. radial and 1. median is larger than the preceding one; *pacificus*. \sim without cell-spot, the spot between the 3. radial and 1. median on the under surface larger than the preceding spot. Central and East Colombia, not rare in Bogotá-collections. The spots on the hindwing are sometimes whitish.

Torquatus-Group.

In the species of the *torquatus*-group the palpus is yellow; the thorax is likewise yellow or at least spotted with yellow and the abdomen has at least a yellow lateral line. Both sexes are tailed, but the tail in the φ is sometimes short and pointed. In colour the $\sigma \sigma'$ and φ are always different; on the whole the φ are more black, the $\sigma \sigma'$ more yellow. The larvae are similar in colour to bird-droppings and bear 4 rows of rather long tubercles. The thoracic hump of the pupa is large.

P. himeros. Both wings with yellow band, which is broader in the σ^2 than in the φ ; tail with yellow apical spot; submarginal spots of the hindwing in the σ^2 yellow, in the φ red except the 2 anterior ones. Brazil; a rather rare species. — baia R. & J. The yellow markings reduced or narrowed. Bahia. — baia. himeros *Hopff.* (= mentor *Boisd.*, herodotus *Oberth.*). The yellow band on the forewing is contiguous to himeros. the cell and is broader than the black marginal area. Minas Geraës; Rio de Janeiro.

P. lamarchei Stgr. (11a). Only the σ^2 know. The yellow band narrower than in *himeros*, forewing *lamarchei*, without yellow spot distally of the anterior angle of the cell; hindwing very strongly dentate, tail without yellow spot at the tip. Harpe short and rounded, whilst in *himeros* it is long and pointed. — In Northern Argentina and Bolivia, not rare.

• P. hectorides *Esp.* (= torquatinus *Esp.*, pandrosus *Godt.*, chirodamas *Hbn.*) (11 a). In the σ the band is still narrower than in *lamarchei*. Hindwing with red spots on the disc. In the \Im the band is absent or is white; on the forewing it is curved anteriorly towards the costa and on the hindwing does not extend to the abdominal margin; the submarginal spots of the hindwing are red and narrow. The \Im occurs in three principal forms: \Im -f. hectorides *Esp.* (= mecentius *Doubl.*, argentus *Gray*) (11 a) has a white band on *hectorides*. both wings; in \Im -f. catamelas *R. & J.* the band is developed on the hindwing, but on the forewing merely *catametas.* indicated; in \Im -f. melania *Oberth.* it is slightly indicated on both wings or entirely absent. These forms *melania.* occur together. — Larva on Citrus and Piperaceae, resting gregariously on the upperside of leaves. The butterfly is common. It is a swift flier, which is found especially at the edges of woods and in the neighbourhood of thickets. Brazil and Paraguay.

29

PAPILLO. By Dr. K. JORDAN.

P. garleppi. σ^2 similar to *torquatus*, but the yellow band broader and the marginal tooth of the 1, median of the hindwing longer; 2 or 3 small spots composed of yellowish and bluish scales placed before the red anal spot of the hindwing; on the underside the posterior discal spot placed at the 2. median is very small and bluish. The anal tergite is long and slender; harpe produced into a long point and furnished with a long pointed process at the ventral margin. The $\hat{\varphi}$ is not known. East Bolivia, East garleppi. Peru and the Upper Amazon are the home of the insect. Two subspecies. - garleppi Styp. Band of interruptus. the forewing not interrupted. Bolivia. - interruptus Stgr. Band of the forewing interrupted. Upper 116-7 Amazon and East Peru.

P. torquatus. σ : the band of the forewing is interrupted between the 2. and 3. radial, rarely torauatus. there is a yellow spot almost filling up the gap; on the under surface of the hindwing a row of red discal spots, of which the last is placed proximally to the last submarginal spot. The 2 very different from the 3° , resembling certain Aristolochia-Papilios which occur together with it; wings brown-black, with or without white patches on the forewing; hindwing above with two rows of red spots, the proximal row incomplete, some of the spots merged together in pairs into 2 or 3 large patches. The anal tergite of the σ^2 spatulate; the harpe broad, denticulate. Larva shiny, as if polished (which is also the case in all the allied species), mottled with light colour, with irregular pale patch before the middle: the colour of bird-droppings. The butterfly is found in forests and in their neighbourhood; the φ is a true woodland species, like the Aristolochia-Papilios whose dress it wears, whilst the 3° disport themselves more in open, sunny localities. tolus. Mexico to Brazil, not known from the temperate part of South America (South Brazil, Argentina). - tolus Godm. & Salv. σ : band of the forewing narrow, the anterior spot long, the 2. short. φ : forewing without white discal spots; hindwing with 2 separated rows of red spots. Tail in both sexes long and spatulate. tolmides. Mexico, apparently rare. - tolmides Godm. & Salv. 3: band broader than in tolus, tail narrower, no spots, or only very small ones, before the upper angle of the cell of the forewing. 9 not known. Chiriqui and d ordnamus. Sevilla Island; likewise rare in collections. — orchamus Boisd. σ : the spots before the upper angle of the cell of the forewing small, the first long spot of the yellow band as long as the 2, or somewhat longer, the submarginal spots of the hindwing usually very distinct. ? with a white spot placed across the cell of the forewing and another spot before the 1. median, as well as usually also a spot before the 3, radial and an indistinct spot behind the 1. median: 4-6 large red spots on the hindwing, cell with spot, tail short, J leptalea. non-spatulate. Colombia; North Venezuela. — leptalea R. & J. J. Vellow band of the forewing narrower than the black marginal area, narrower than in all the other forms of this species; the spots before the apex of the cell small; the submarginal spots of the hindwing distinct, the apex of the cell on the under surface black as far as the base of the 1. median; tail spatulate. \Im similar to that of orchamus, the white v torquatus. spot between the 2. and 3. spot of the forewing and the cell-spot smaller. West Ecuador. - torquatus Cr. (= pelaus F) (11b). σ' : the spots before the apex of the cell of the forewing mostly larger than in the other forms, the two subapical spots of the band broad, the 1. shorter than the 2., the band at least half as broad again as the black submarginal area; the submarginal spots of the hindwing usually strongly darkened by black scaling. The 2 very variable; the tail always slender, commonly short: 5 principal theras. forms: 9-f. theras R. & J., forewing with cell-spot, which however does not extend across the cell, and one caudius. or more spots on the disc: 9-f. caudius Hbn. has no cell-spot, but several discal spots, of which the one patros. placed between the 1. and 2. median is the largest; 9-f. patros Gray (11b) has no white spots on the flavida, forewing, the patches on the hindwing are red; Q-f. flavida Oberth. (= flava Haase) resembles patros, but cleolas, the patches on the hindwing are yellow-white; 9-f. cleolas R. & J. has no spots on the forewing, but on its under surface a yellowish white submarginal band. These different forms of the 2 occur only partly together, the first 4 are known from the Upper Amazon, but the 5. form, which we have from Bolivia, may also be found there. East and South Venezuela, the Guianas, the Amazons and the eastern slopes of polybius, the Andes of Ecuador, Peru and Bolivia. – polybius Swains, (? == tros Hbn., trojanus Boisd.) (11b) inhabits Brazil, Matto Grosso and Paraguay. In the 5 the spots before the apex of the cell of the forewing are small and the submarginal spots on the underside rather large: on the hindwing beneath the cell is entirely or almost entirely yellow; the tail broad. The 2 occurs only in one form: forewing with spot in the cell and a large patch between the 1. and 2. median; tail spatulate, with rounded tip.

P. tasso Stgr. (11a). σ : band of the forewing abbreviated, the subapical part wanting. \mathfrak{S} with tasso. broad white band, which begins on the forewing at the 3. radial and extends to the hindmargin of the hindwing: the cell of the forewing beneath with a few yellow streaks; the tail non-spatulate. -- Only a few old specimens known, which probably came from Brazil.

peleides. P. peleides Esp. Perhaps an artefact; only known from JABLONSKY's figure; is it perhaps a West Indian representative of torquatus not rediscovered? σ : forewing with a yellow macular band of almost uniform breadth, curved forward to the costa; hindwing with yellow submarginal spots, the last of the row red, as well as one placed proximally to it at the hindmargin; tail spatulate.

Zagreus-Group.

The remaining Fluted-Papilios are powerfully built insects with strong neuration in the forewing. The frons is either quite black or bears a yellow mesial line, never a yellow lateral streak along the eye. In the mimetic *zagreus*-group the autennae are long, yellow, with thin club; the frons has a yellow mesial stripe, the breast is diagonally streaked with yellow, the abdomen is for the most part yellow, the costal margin of the forewing is not dentate, the cell of the forewing is broad and the hindwing is rounded, without a tail. The species resemble *Tithorea* species, but are much more powerfully built. The earlier stages are unknown. The \mathfrak{P} are very rare in collections; they are similar to the $\Im \Im$.

P. zagreus *Doubl.* (1t c). The spots of the forewing orange, the marginal ones yellow; hindwing *zagreus*. orange, a marginal band enclosing a yellow submarginal spot, a basal subcostal area, a patch in the extremity of the cell. as well as several spots on the disc, black. — Venezuela and Colombia, southwards to Bolivia, descending on the Amazon as far as Ega; varying individually, but not distinctly geographically.

P. ascolius. Hindwing without black spots in the cell and on the disc. Chiriqui to West Ecuador, occurring in Colombia together with the preceding species. Geographically and individually variable. — zalates Godm. & Salv. is the most northern form. The cell area of the forewing is dusted with black, the zalates. subapical cell-spot is narrow, the discal spots are short, the marginal area of the hindwing narrower than in the other forms and the hindwing beneath deeper orange. Republic of Panama, found in various localities. — daguanus R. & J. The cell-spot of the forewing as in zalates, the discal spots on the contrary as daguanus. in ascolius, the discal spot between the t. and 2. radial much shorter than the one placed behind it; hindwing pale, much less orange than in ascolius, the black basal streak broad, entering the cell, behind this streak a large black spot on the disc. West Colombia, at the Rio Dagua. — ascolius Fldr. (11 c). The ascolius 'v basal area of the cell of the forewing always pure pale yellow, between the 3. radial and 1. median two spots touching the cell; cell of the hindwing and the adjoining parts of the forewing large, the discal rosenbergi. spot between the 1. and 2. radial usually small, sometimes absent, rarely large, the following discal spots on the whole larger than in the preceding forms, whilst the posterior submarginal spots are smaller; the hindwing mostly very pale, yet sometimes more orange than the palest specimens of ascolius. West Ecuador, found by Roysensen at a height of 1000 to 3500 ft.

P. bachus. The orange area of the hindwing of the preceding species is here only represented by a narrow variable band; however, the veins are often more or less yellowish on the underside. The \mathfrak{P} is not known. Colombia to Bolivia. Two subspecies. — bachus *Fldr*. (11 c). The yellow spots of the fore-bachus. wing above and beneath quite pale, only the proximal cell-spot and the posterior discal spots somewhat orange. Colombia: found by Dr. Bürger at the beginning of the rainy season in the Cordillera of Bogotá; rare in collections. — chrysomelus R. & J. The forewing orange above and beneath from the base to the *drysometus*. disc, at the costal margin more or less pale yellow. Peru and Bolivia, not rare. From Ecuador no specimen of *bachus* has become known to us. — the transmitter the product the product of the

Scamander-Group.

P. hellanichus, scamander, birchalli and *xanthopleura* belong to the *scamander*-group. The frons is black and the otherwise black palpus has a white dot. The costal margin of the forewing is feebly dentate, especially near the base, but the dentition only becomes distinct if the margin is deuded. Only the larva of *scamander* is known; when full-grown it is black-brown beueath, green elsewhere, and bears a transverse band before and behind on the 3, thoracic segment, as well as two diagonal bands on the abdomen, which are usually united on the back, forming an X-shaped mark. The young larva on the contrary is brown and has on the middle segment and on each of the posterior ones a large grey patch. The pupa is green or brown-grey; it is fastened low down on the stem, usually close to the ground. On Magnolia, Canella and Citrus.

P. hellanichus *Hew.* (1t d). The yellow spots on the upper surface of the wings are large. The *hellanidus*, insect reminds one superficially of *machaon*, with which, however, it is not closely allied. The markings of the under surface as well as the structure prove that *hellanichus* is the southern representative of *scamander*. The cell has also on the upper surface a yellow spot, which on the forewing is sometimes very small, on the hindwing always large. The spots of the discal band have almost all reddish tips. \Im quite similar to the σ . — Uruguay and the adjoining parts of Argentina and Brazil, especially in the neighbourhood of the river and on the islands in the estuary of the La Plata.

P. scamander. Cell of the forewing without spot, that of the hindwing sometimes with a small spot; a pale yellow curved discal band, broken up into spots, on both wings. σ^3 and φ very similar. Larvae and pupae described above. Brazil, common in hilly country, though not everywhere. Three geographical forms, which completely intergrade. — grayi *Boisd*. The submarginal macular band of the forewing evenly grayi. curved, the discal band broadest posteriorly; the red discal spots on the under surface of the hindwing separated from the discal band. Bahia to Paraná. — eurymander *Hopff*. The first 2 or 3 submarginal *curvmander*.

PAPILIO. By Dr. K. Jordan.

spots of the forewing more proximal than the other spots of this row, the submarginal spots of the hindwing partly pale yellow; the basal area of the hindwing beneath pale, often partly yellowish, the red discal scamander. spots small or absent. Santa Catarina and the adjoining districts of Rio Grande do Sul. - scamander Boisd. (11 d). Discal band of the upper surface more yellow; under surface of the hindwing pale yellow, with black veins and without red discal spots. Abdomen laterally pale yellow. Rio Grande do Sul.

P. birchalli. J: body black, claspers usually with pale yellow spot. Forewing above with 2 rows of spots before the margin; the anterior spots of the proximal row more or less indistinct; hindwing with broad discal band and a row of submarginal spots; the markings for the most part greenish; tooth of the 3. radial only a little more projecting than the other marginal teeth. Beneath the forewing has a cell-spot, an oblique row of discal spots and a row of submarginal spots abbreviated anteriorly; on the hindwing is a discal and a submarginal row of red spots, the middle discal spots small, the last one large and yellowish white. In the 2 the markings of the upperside are more bluish and the discal band of the hindwing is very broad. Panama and Colombia; according to DRUCE it occurs also in North Argentina, which appears to godmani. us doubtful. — godmani R. & J. The last spots of the discal band of the hindwing above indistinct and birdualli. the band broader in the middle than the black marginal area. Panama: Chiriqui and Bugaba. — birchalli Here. (11 d). The discal band of the hindwing above narrower than in godmani and its two last spots distinct. Colombia: Magdalena and Cauca Valleys.

P. xanthopleura Godm. & Salv. (12c). Sides of the abdomen yellow; under surface of the hindwing xanthopleura without discal band, the red submarginal spots large. The \mathfrak{P} in two forms: \mathfrak{P} f. xanthopleura is similar to diaphora. the J, whilst 2-f. diaphora Stgr. has a large pale yellow area on the upperside of the forewing. --Upper Amazon.

Homerus-Group.

All the following Fluted-Papilios are distinguished by a strongly dentate costal margin of the forewing in the σ , which is weaker in the \mathfrak{L} . The black abdomen is never spotted, but the underside of it in some forms is yellowish olive-brown. The antennae are short and the frons is broad. Like the preceding species they are forest insects, which occur in the mountains, especially at medium heights.

P. victorinus. A Central American species, occurring from Mexico to Costa Rica. or: two rows of pale yellow spots on the upper surface between two rows of bluish grey spots, which are distinct especially on the hindwing. Hindwing beneath with a row of red, black-edged discal spots and a row of crescent-shaped submarginal spots: tooth of the 3. radial only very little prolonged. Larva green above, grey beneath, anteriorly with two transverse grey, spotted, dorsal bands; abdomen laterally grey, dorsally moretius, with two angle-shaped spots. Two broods. - morelius R. & J. Discal spots of the forewing small or victorinus, absent, no cell-spot on the underside. West Mexico. - victorinus Doubl. (11 d). or: discal row of the forewing consisting of at least 3 spots; usually a row of bluish grev postdiscal spots present; discal spots of the under surface of the hindwing larger than the submarginal spots. The 2 in two forms: 2-f. victorinus *Doubl.* (= helleri Fldr.) is similar to the σ^* , but the spots of the upper surface, especially of the hindwing, amphissus, are mostly larger; in \$-f. amphissus Hopff. the hindwing has a bluish or greenish discal band, much *vulneratus.* broadened posteriorly. East Mexico to Nicaragua. — **vulneratus** *Btlr*. The discal spots of the upper surface of both wings larger than in the two preceding subspecies; hindwing without bluish spots distally to the discal row. Costa Rica, only one or known (in coll. F. DUCANE GODMAN).

P. cephalus Godm. & Salr. 7: tailed, two rows of spots on the upperside of the forewing, the submarginal row uniformly curved. Underside of the hindwing with bluish crescents distally to the discal spots. - Chiriqui, one of in coll. STAUDINGER; perhaps only a tailed specimen of P. cleotas archytas (the genitalia should be compared!).

P. cleotas. Forewing above with a submarginal row of spots, curving in front towards the costa, and an oblique discal row of larger patches posterior to the lower angle of the cell; hindwing with discal band and submarginal spots. Under surface of the hindwing with a row of red discal spots, which are proximally more or less yellow, the last spot always pale yellow. The 2 in two forms, one similar to the σ , the other with broad bluish or greenish band, diffuse proximally. Distributed from Costa Rica to South Brazil, but not known from Bolivia to Ecuador, nor from the Guianas, the Orinoco or the Amazon, being replaced in these districts by *P. aristeus.* — **archytas** *Hopff.* (σ^2 = lactitia *Btlr.*). σ^2 : the cell-spot and the middle *archytas.* discal spots of the forewing smaller than in the next form. In the dimorphic \mathfrak{P} , \mathfrak{P} -f. **archytas** *Hopff.* (σ^2 = lactitia *btlr.*). σ^2 : the cell-spot and the middle *archytas.* discal spots of the forewing smaller than in the next form. In the dimorphic \mathfrak{P} , \mathfrak{P} -f. **archytas** *Hopff.* (σ^2 = *harchytas.* discal spots of the forewing smaller than in the next form. In the dimorphic \mathfrak{P} , \mathfrak{P} -f. **archytas** *Hopff.* (σ^2 = *harchytas.* discal spots of the forewing smaller than in the next form. In the dimorphic \mathfrak{P} , \mathfrak{P} -f. **archytas** *Hopff.* (σ^2 = *harchytas.* discal spots of the gravity smaller than in the next form. In the dimorphic \mathfrak{P} , \mathfrak{P} -f. **archytas** *Hopff.* (σ^2 = *harchytas.* discal spots of the gravity smaller than in the next form. In the dimorphic \mathfrak{P} , \mathfrak{P} -f. **archytas** *Hopff.* (σ^2 = *harchytas.* discal spots of the gravity smaller than in the next form. In the dimorphic \mathfrak{P} archytas *Hopff.* (\mathfrak{P} -f. **archytas** *Hopff.* (\mathfrak{P} clearchus. spot of the forewing usually more oblique than in archytas, sometimes absent (ab. clearchus Fldr.), and the anterior submarginal spots larger than the posterior ones; tail distinct; harpe dentate at the dorsal margin, with a strong apical hook curved inwards, the dorsal prong of the fork short.

32

cephalus.
Publ. 30, XII. 07.

PAPILIO, By Dr. K. JORDAN.

33

The 2-f. phaeton Luc. is similar to the σ . The second form, 2-f. syndemis nov., has a broad bluish band syndemis. on the hindwing; the discal spots of the upper surface of the forewing are bluish, the middle ones only indicated, those of the under surface are only represented by a few indistinct little spots; hindwing above with distally convex bluish crescents outside of the discal band; discal band of the underside reduced, consisting of small, black-edged red spots; tail long; one specimen, from Bogotá, in the Tring Museum. coroebus Fldr. or: the cell-spot of the upper surface of the forewing is absent, or it is more or less distinct coroebus. but diffuse (ab. philocleon Fldr.); the discal spot between the 3. radial and 1. median usually more proximal philocleon. than in *phaeton*, the submarginal spots smaller; on the hindwing the discal band broken up into spots; the 3. and 4. spots reduced; the dentition of the harpe more regular and the dorsal process longer than in phaeton The form of the \Im similar to the \Im is \Im -f. dione R. & J.; in the second form, the \Im -f. coroebus Fldr., dione. the markings of the upperside are bluish and the discal band on the upperside of the hindwing is strongly widened posteriorly, also the discal spots of the hindwing beneath are reduced. East side of the Cordillera of Bogota; Northern Venezuela. — cleotas Gray (= lycortas Fldr). or: discal band of the upper surface cleotas. of the forewing more oblique than in the other subspecies; a row of nebulous bluish grey spots between the cell and the submarginal spots: harpe terminating in a two-pronged fork, whose prongs are straight and approximately of equal length. In the \mathfrak{P} the middle vaginal lobe is short, the side one narrow and pointed. The two colour varieties are: 2-f. cleotas Gray, similar to the or, and 2-f. adaea R. & J., in which both wings adaea. (above have a discal and a postdiscal row of bluish patches. Brazil, from the province of Rio de Janeiro (Petropolis) to Rio Grande do Sul; according to Boisduval also in Uruguay, but the statement appears to us doubtful.

P. aristeus. Cell-spot of the forewing very large, the discal spot between the 3. radial and 2. median very long, forming with the cell-spot a large pale yellow area. The \mathfrak{P} resembles the σ , or the markings of the upperside are bluish and the discal band of the hindwing is broad; both forms on the underside with large, more or less distinct pale yellow cell-patch. South America and Panama. — aristeus Cr, ($\sigma^2 = aristeus$. bari Oberth.). St the cell-spot of the forewing rhombiform, the discal spot placed before the 1. radial long, the next extending almost to the submarginal row, the third small and indistinct; discal band of the hindwing above only distinct posteriorly. Only one form of the 2 known (CRAMER's figure): forewing with long, indistinct grey-blue longitudinal streaks and hindwing with very broad bluish band. French and Dutch Guiana: one J in coll. CHARLES OBERTHÜR. - ctesiades K. & J. Cell-patch of the forewing longish, nearly ctesiades. reaching to the base, two large, long discal spots, as well as a long triangular spot behind the 2. median and the cell; discal spots of the upper surface of the hindwing small, red. Upper Amazon. - desmias R. & J. desmias. Cell-spot shorter and narrower than in clesiades, a small spot in the apex of the cell, a second distally to it, two large discal spots and behind the base of the 2. median a spot which is smaller than in ctesiudes; hindwing as in bitias. Province of São Paulo, Brazil; one J in coll. F. DUCANE GODMAN. -- bitias Godt. bitias. (= eurotas Fldr.; ctesias Fldr.; lacordairei Borre) (13 a). ♂: cell-spot of the forewing more transverse than in the preceding subspecies: discal band of the hindwing never complete, only indicated, or interrupted in the middle. 2 dichromatic: 2-f. bitias Godt. resembles the σ ; 2-t. therapes R. & J. is similar to the 2-f. therapes. aristeus, but the bluish streaks of the forewing are shorter and the band of the hindwing is narrower, also the cell-spot of the under surface of the forewing is partly pale yellow. Common on the east side of the Andes of Ecuador and Peru; upper course of the Rio Negro; Bogotá and Chiriqui; the last two localities appear to us doubtful. -- vilcanotus R. & J. Cell-spot of the hindwing and costal spot of the hindwing vilcanotus. brownish yellow. Vilcanota, South Peru. - coelebs R. & J. Cell-spot of the forewing narrow, transverse, coelebs. the discal spot between the 1. and 2. median narrow, triangular, not reaching to the cell, the submarginal spots large, indistinct grey-blue spots between them and the cell; hindwing with broad pale yellow discal band, submarginal spots large, pale yellow. On the underside the cell-spot of the forewing smaller than in bitias and lenaeus. North-west Peru and Northern Central Peru (Tambillo, Chachapoyas), as well as Southwest Ecuador. - lenaeus Doubl. Cell-spot of the forewing transverse, not so oblique as in bitios, a discal tenaeus. spot before the 3. radial, the discal spot behind the 1. median proximally narrowed and abbreviated; discal band of the hindwing complete, or narrowly interrupted. Rather common in South-East Peru and East Bolivia, the 2 not known or at least not described.

P. judicaël Oberth. (13b). σ : cell-spot of the forewing narrow, transverse and like the 4 discal judicaël. spots brown-yellow; hindwing strongly dentate, tailed. Cell-spot of the under surface of the forewing large, brown-yellow, the submarginal spots small; discal band of the hindwing dirty white, orange-red distally. — Only one σ in coll. OBERTHÜR, from Huambas, Amazonas, North Peru.

P. garamas. σ^* : both wings on the upperside with a pale yellow discal band and a row of submarginal spots; margin of the hindwing strongly dentate, with spatulate tail; discal band of the underside of the hindwing brownish orange distally. The \Im similar to the σ^* , or the yellow discal band is absent and the hindwing has very strongly curved, more or less reddish, discal crescents. Central America. — ab-*abderus*. **derus** *Hopff.* (12b). σ^* : forewing with 4 submarginal spots, often with indication of a fifth, the discal band of the hindwing enters the cell, the submarginal spots are absent; the orange-red teeth of the discal band of the hindwing beneath of equal breadth on both sides of the veins, shorter than in the following sub-

PAPILIO. By Dr. K. JORDAN.

species. One form of the φ similar to the σ . but the submarginal spots of the upper surface of the hindwing often indicated and the teeth of the discal band reddish-yellow also above: 9-f. abderus Hopff.; in amerias. the second form, Q-f. amerias R. & J. (12b), the forewing has besides the submarginal spots a row of brown-grey nebulous discal spots, the red crescents of the hindwing very large. Vera Cruz in East garamas. Mexico. – garamas Hbn. (σ = asclepius Hbn.; cincinnatus Boisd.; concinnatus Gray). σ : submarginal spots of the upper surface of the hindwing distinct; the yellow-red teeth of the discal band of the hindwing beneath less long than in *abderus*, the part of each tooth placed before the vein shorter than that amisa. placed behind it. Forewing beneath without nebulous brown-grey discal spots. The 2-f. amisa R. & J. is similar to the σ^2 , being distinguished in colour from 2-f. *abderus* chiefly by the distinct submarginal spots of the upperside of the hindwing; 2-f. garamas Hbn. is similar to the 2-f. amerias, but the nebulous discal spots of the upper surface of the forewing are crescent-shaped, the discal crescents of the hindwing are shorter, the blue spots larger and the submarginal spots thinner than in 2-f. amerias. Both sexes larger baroni. than the East Mexican subspecies. West Mexico: Guadalajara, Cuernavaca, Oaxaca. - baroni R. & J. Forewing with 5 submarginal spots, the 5. spot much nearer to the margin than the 4.; submarginal spots of the hindwing indicated, the discal band entering the cell; on the under surface of the forewing the submarginal line interrupted at the 2. radial, the posterior part of the line being much nearer the margin than the broader anterior part. The dorsal prong of the fork of the harpe much shorter than the ventral prong. v electryon. Guerrero, 1 o⁷ in the Tring Museum. — electryon Bates. o⁷: the cell-spot of the discal band of the forewing narrowed towards the costa; no submarginal spots on the upperside of the hindwing. Beneath the band of the forewing is strongly dentate on the disc and there are no nebulous spots present distally to this band; upper prong of the harpe curved downwards. The 2 not known. Guatemala and (?) Honduras. syedra. syedra Godm. & Salv. Cell-spot of the forewing of equal width anteriorly and posteriorly; 5-7 submarginal spots on the forewing, the 3. the largest; discal band of the hindwing more strongly dentate than in electryon, large blue spots distally to it; no submarginal spots. Beneath the apical area of the forewing and the basal area of the hindwing pale brown (as in *baroni*). the vellow-red margin of the discal band of the hindwing more deeply coloured than in *electryon* and broader between the veins. The φ similar to the σ ; the discal band of the upperside of the hindwing partly yellow-red distally. The upper prong of the harpe of the or reduced to a tooth, the ventral prong long. Costa Rica and Chiriqui. A large form.

homerus. P. homerus F. (12 a). Similar to the preceding species; the discal band of the forewing continued round the apex of the cell to the costal margin, the cell-spot sometimes isolated; discal band of the hind-wing beneath non-dentate, brown, its proximal margin yellowish white, large black spots proximally to the red submarginal spots. — Larva on Thespesea, green above, brown beneath, marked similarly to that of *scamander*. Thoracic horn of the pupa short. The insect is apparently not rare at certain places in the interior of Jamaica, but is difficult to catch, as it flies at a considerable height above the ground. According to AARON occurs also in St. Domingo.

P. warscewiczi. Abdomen woolly beneath, brownish yellow like the breast. Forewing without cell-spot, 2 almost parallel rows of spots between cell and margin; hindwing with discal band and submarginal spots, tailed. Beneath the apical area of the forewing and the hindwing are pale brown (all that is visible when the butterfly holds the wings closed together); cell of the forewing with white or yellow spot; hindwing with dentate discal band. The 2 not known to us. Ecuador to Bolivia; a mountain species. jetskii, jelskii Oberth. Discal spots of the forewing and discal band of the hindwing not sharply defined. Discal spots of the underside of the forewing large and brown, the marginal area much widened before the middle; the brown postdiscal spot between the 3. radial and 1. median larger than in the other forms, the submarginal spot between the 1. and 2. median orange in the middle. The two prongs of the harpe (σ^2) straight, the upper one much longer than the lower. South Ecuador, North and North-West Peru. mercedes. mercedes R. & J. Discal spots of the forewing on the whole larger than in jelskii, the blue spots of the hindwing broader, the brown marginal area of the underside of the hindwing narrower before the middle, submarginal spot between the 1. and 2. median of the hindwing not orange beneath. The two prongs of the harpe (σ^2) straight, generally of equal length or the lower one somewhat shorter than the upper. East warscewiczi, Peru: Huánuco and Junin. - warscewiczi Hopff. (= soratensis Godm. & Salv.) (12b). Discal spots of the forewing much smaller than the submarginal spots; discal band of the hindwing broken up into spots, often only indicated, on the under surface often entering the cell and like the submarginal spots brown. The upper prong of the harpe (σ^{7}) strongly curved. South-East Peru and Bolivia.

P. cacicus. Forewing with interrupted discal band, a variable cell-spot, rarely absent, a row of bluish grey postdiscal spots and a row of yellowish white submarginal ones, the last or the last few of the submarginal spots more or less orange; on the hindwing a yellowish white median band, a postdiscal row of blue spots and a submarginal row of yellowish white ones. The 2 occurs in 3 forms. Venezuela, Colombia, cacicus. Ecuador and East Peru. — cacicus Luc. (12 c). d: the cell-spot of the forewing, if present, more or less zaddadai. transverse. The 3 forms of the 2 are: 2-f. cacicus Luc., similar to the d: 2-f. zaddachi Dewitz, discal band of the forewing not interrupted and like the large cell-spot brownish orange, hindwing without discal

band on the upper surface: \Im -f. nais R. & J. like \Im -f. zaddachi, but the markings of the forewing white nais. Mérida in Venezuela. Colombia and Ecuador. — inca R. & J. The cell-spot of the forewing much more inca. ~ oblique than in the preceding subspecies, forming with the median vein an acute angle; discal band of the hindwing convex distally, posteriorly strongly narrowed; the tail narrow, non-spatulate. Chanchamayo.

P. euterpinus Godm. & Salv. (12 c). Tailless; markings of the upper surface yellowish red. The φ euterpinus. similar to the σ , somewhat paler and larger. — From West Colombia to North Peru. The butterfly is an enlarged copy of the Pierid genus *Pereute*. The insect is usually considered as nearly allied to *zagreus*, but according to the structure and markings it belongs to the *homerus*-group near to *cacicus*. The butterfly is still very rare in collections.

C. Kite-Swallowtails.

Antenna with more distinct club than in the Aristolochia- and Fluted-Papilios, scaled on the upperside, but the scales, like those of the tibiae and tarsi, easily fall off, the fine sensory hairs are distributed as in the Fluted-Papilios. The dorsal spines of the tarsi are separated from the ventral spines by a spineless, impressed interspace. The wings in most species are thinly scaled, the scales often modified to fine hairs; the blue or green bands of many species of the Eastern Hemisphere are only covered with fine hairs on the underside, the pigment lying in the membrane of the wing, in the American Kite-Papilios also the membrane of the wing is green at least at the base, with the exception of the dark mimetic species. In a great number of these Papilios the 1. or 1. and 2. subcostals of the forewing are distally fused with the costa: the cell of the hindwing is mostly narrow and its anterior margin incurved between the subcostal and the 1. radial. The abdominal margin of the hindwing in the σ is widened and usually bent over; in this fold lies a scent-organ, which is rarely absent; the scent-scales are sometimes very different in nearly allied species: but the organ also varies geographically. The apical margin of the 8. abdominal dorsal segment of the 3, which becomes visible after the removal of the genitalia, is smoothly scaled, the small scales standing erect; except in the Kite-Swallowtails this character is found in no American Papilio; the 10. dorsal segment of the $\sigma'\sigma'$ of the American Kite-Papilios is likewise characteristic; this anal process is divided into three parts by two narrow incisions, only in P. celadon the process is simple in consequence of the absence of the two side parts. - Unfortunately the larva of only very few species is known. The 3. thoracic segment is swollen, as in the larvae of the Fluted-Papilios; the thoracic segments and the anal segment often bear dorsally short thorns, also traces of tubercles are usually found on the other segments; the pattern consists of small spots, transverse lines or short longitudinal streaks, eye-spots and oblique bands are wanting. - The pupa is shorter than in the other Papilios, the head and thorax are not at all or only weakly curved upwards, the thoracic horn is long and four-sided, the lateral carina forming the prolongation of the raised edge of the case of the hindwing; the abdomen has two dorsal carinae, which converge in front and behind: the anal segment is longer than broad. - The butterflies are in great part longwinged insects with triangular hindwing. The long-tailed forms with the wings spread out remind one of a paper kite. The Kite-Papilios are nimble fliers. Although the mimetic forms usually imitate the sluggish flight of their models (Aristolochia-Papilios, Pierids, Danaids etc.), yet they show great adroitness and speed when they take to flight in alarm. The σ^{σ} often congregate in great crowds in moist places, at the edge of rivers, lakes, puddles etc., where they drink with a quivering motion of the half opened wings: they also visit flowers. The Kite-Papilios are insects of the open, sunny part of the wooded districts, of the clearings in the forests and their edges. Naturally this refers more to the $\sigma^2 \sigma^3$ than to the \$\vee\$; the latter, of many species at least, are only rarely taken by the collector, because they have different habits, remaining in the thickets and woods and not joining the crowds of $\sigma\sigma$ drinking at the water; the \mathfrak{P} of many very common forms are not yet known at all. The Kite-Papilios do not extend so far north as the Fluted-Papilios.

Lysithous-Group.

The species of the *lythisous*-group are characterised by red basal spots on the under surface of the wings. HAASE rightly recognised these forms, so similar in appearance to the Aristolochia-Papilios, as belonging to the Kite-Papilios; all other authors have erroneously classified them with the Aristolochia- and Fluted-Papilios. The brightcoloured larvae are striped longitudinally and bear a V-shaped saddle-spot before the middle; the thorax is spotted. The pupa is short; the abdomen elarged in the middle. The species are found from Mexico to Argentina.

P. pausanius. A copy of *Heliconius clytia L.* According to BATES the butterfly certainly has the sailing and circling flight of the Heliconians, yet is not, like the Heliconians, a species of the forest shades, bit is found on the muddy banks of rivers and lakes or the round the tops of high trees. Wings above green-blue, with large pale yellow area on the forewing, hindwing short, often truncate. The scent-organ is wanting in the σ . The \mathfrak{P} resembles the $\dot{\sigma}$. From Costa Rica to Northern Brazil (Goyaz), — prasinus prasinus. *C. & J.* Wings above strongly metallic; discal spots of the forewing longer than in the following form, the white submarginal spots of the hindwing very small, the anterior ones only indicated, the red basal spots of the underside smaller than in the remaining subspecies. Costa Rica. — cleombrotus Streck. from cleombrotus.

PAPILIO. By Dr. K. JORDAN.

West Colombia and probably Panama; as in prasinus the forewing without pale apical area; costal area of the upperside of the forewing almost black, in prasinus almost as metallic green as the disc; underside of pausanias. the hindwing without pale (yellow-green or reddish) streaks between the veins. - pausanias Hew. (= hermolaus Guen.) (12a). Apex of the forewing with large grey area; under surface of the hindwing between the veins with pale streaks, extending to the submarginal spots. Central Colombia to Bolivia, Orinoco, the Amazons and Goyaz.

microdamas.

P. microdamas Burm. (12 a). A yellowish band from the costal margin of the forewing to the anal angle of the hindwing; under surface without red basal spots on the forewing, with 4 spots on the hindwing. 2 similar to the J. - Paraguay, Northern Argentina, Caraça in Brazil; a lowland species.

P. protodamas Godt. (= hyperion Hbn). Forewing with yellowish area consisting of 3 large patches, or with 1 or 2 rows of spots; hindwing with yellowish grey-blue band; forewing beneath without basal spots, hindwing with 3. The scent-organ of the or wanting. Larva black, with grey and white, partly yellow stripes, the thorax dotted with white and yellow. Thoracic horn of the pupa rather thin. Two protodamas. individual forms of the butterfly are known: in f. protodamas Godt. the forewing has two rows of spots, choridamas. the upper ones of which are more or less merged together; in f. choridamas Boisd. (13b) the forewing has a very large cell-spot and two discal patches, also large. - The butterfly is entirely Brazilian; it is found from Minas Geraës to Rio Grande do Sul; but the f. choridamas does not appear to extend so far south, being only known to us from the provinces of Rio de Janeiro and Minas Geraës.

P. phaon Boisd. Similar to the preceding species; the spots on thorax and abdomen red, the posterior abdominal segments with red lateral spots. Very variable. Spots on the upper surface of the forewing bluish yellow-grey or purer white-yellow; discal band of the hindwing grey-blue, rarely red. Under surface without distinct cell-streaks, forewing without basal spots, hindwing with 3. Scent-scales present in the or. Mexico to West Ecuador and Venezuela. The following forms have been described as xenarchus. species: ab. loc. xenarchus Hew., hindwing with broad red band; ab. loc. eridamas Reak., the red band of eridamas. the hindwing narrow, the spots composing it separated; these two forms only known from East and South phaon. Mexico; ab. phaon Boisd. (13b), forewing with submarginal spots, but without discal spots, the band of *ulopos.* the hindwing just entering the apex of the cell; ab. **ulopos** Gray (= immarginatus Oberth), forewing without spots or with only indications of them, band of the hindwing broad, entering more or less far into the cell; therodamas. ab, therodamas Fldr., with discal and submarginal spots on the forewing and narrow, slanting band on the metaphaon. hindwing, separated from the cell; ab. metaphaon Butl. has on the hindwing a very large blue-green discal pharax area, occupying a good part of the cell; in ab. pharax Godm. & Salv. the hindwing has a red anal spot and the discal band is remote from the cell. All these forms are connected with one another by transitions.

P. euryleon. The spots of the breast and abdomen red, the posterior abdominal segments with red lateral spots. Forewing above with yellowish grey area before the hindmargin, hindwing with red discal area or band. Beneath the forewing without red basal spot, the hindwing with three, but the spot placed in the cell commonly only indicated or quite absent, the discal band smaller than above, pale red. 2 similarto the 3 or different from it: in the latter case forewing with cell-spot and two discal bands, all white, recalling pausanius and protodamas f. choridamas. Scent-organ of the d usually present. Costa Rica to clusoculis. Ecuador. - clusoculis Bull. (13c). Discal area of the forewing white-grey; the red hand of the hindwing broad, always entering the cell. ♀ similar to the ♂, the red band of the hindwing somewhat pithonius. broader. Costa Rica; Chiriqui. — pithonius R. & J. ♂: forewing with small or large grey spot; hindwing with 3-5 red duscal spots, the red submarginal spots of the under surface of the hindwing very small or only indicated. 2 with large cell-spot on the forewing and 2 large discal spots. West Colombia euryteon. and Cauca Valley. — euryteon Hew. (13c). S: hindwing above mostly with 4 spots placed close to the cell and two small, less distinct spots before the abdominal margin; the discal spots on the underside pale red. 2: the cell-spot of the forewing narrowed anteriorly, the band of the hindwing entering the cell. haenschi. Magdalena Valley, Cordillera of Bogotá. - haenschi R. & J. J. J. area of the forewing lighter grey than in euryleon, composed of two spots, the anterior spot projecting distally; hindwing with small cell-spot, which is rarely absent, and 3-5 spots placed close to the cell; beneath the forewing has a large white spot between the 1. and 2. median, a grey spot behind it; hindwing with 3 pale red spots, the 1. and 2. touching the cell, a 4. spot often indicated. 2: the cell-patch of the forewing does not extend across the cell, hand of the hindwing running from the 1. radial to the abdominal margin, entering the cell, behind the cell proximally whitish, as in the 9 of the Aristolochia-Papilio P. iphidamas calogyna. 37 with scent-organ. In anatmus. Western Ecuador. - anatmus R. & J. J. I. the grey area of the forewing extending from the hindmargin costad as far as the 2. median or beyond, often a grey streak in the cell; hindwing with 3 red spots, separated from the cell, often only the 3. spot distinct: beneath the forewing without white spot and the discal spots of the hindwing usually grey. I not known. Scent-organ absent in the J. East Ecuador.

hipparchus. P. hipparchus Stgr. (13d). J: forewing with a row of grey submarginal spots; hindwing with pale reddish discal band, extending from the 1. radial to the abdominal margin. 2 not known. Cauca Valley. Colombia.

P. harmodius. σ and φ different. The spots on head, thorax and coxae yellowish white. σ : forewing somewhat transparent apically, before the hindmargin a white area of variable extent, but never reaching to the 3. radial; hindwing with a band of red discal spots. Beneath the cell of both wings streaked with black, forewing with red costal basal spot, hindwing with 3 basal spots. In the 2 the hindwing similar to the σ , or the macular band white or yellow; the forewing either without spots, or with white cell-patch and two large discal patches. Colombia to Bolivia; a species of the Andes, very common in the eastern valleys of Ecuador, Peru and Bolivia. Larva not known. - isus Oberth. (= aristogiton Stgr.). o7: the white isus. area of the forewing large, extending from the hindmargin to the 2. median or beyond; discal band composed of 6 or 7 white-centred spots. 9 not known. - Cauca Valley, Colombia. - halex R. & J. Forewing as halex. in the preceding subspecies; hindwing with 5 red discal spots. 9 on the forewing with white area from the 3. radial to the 2. median and a small cell-spot; hindwing with 5 pale red discal spots. Colombia; in Bogotá-collections. — xeniades Hew. 3: the white spot of the forewing very variable, always extending xeniades. to the hindmargin of the wing, usually excised at the costal side, always small on the underside; hindwing with 3-5 discal spots, which are red above, rarely whitish in the middle, and beneath always reddish white with red distal margin. \mathfrak{P} : dichromatic: \mathfrak{P} -t. androna R. & J. (13d) with quite small grey scaling androna. in and behind the cell of the forewing and 5 red discal spots on the hindwing; the second form, \mathfrak{P} -f. virginia Kirby, is very similar to the 2 of P. erlaces lacydes, forewing with large white cell-spot and two virginia. large discal patches. band of the hindwing white with faint red margins. *Xeniades* occurs in Ecuador and West Colombia. — **imaus** R. & J. (14a). Not constantly different from the σ of the following subspecies, *imaus*. forewing above mostly with white streak at the hindmargin, beneath the white spot is usually smaller than in harmodius Doubl. $\hat{\varphi}$ as the $\hat{\varphi}$ -t. virginia, but the cell-spot narrowed anteriorly, the anterior discal spot reduced and the band of the hindwing yellow above, almost white beneath. Eastern slopes of the Andes of North and Central Peru. - harmodius Doubl. (13 c). dr: forewing above and beneath always with large harmodius. white spot, not quite reaching to the hindmargin. 2: the white cell-spot does not extend across the cell; three discal spots, the 1. small, the 2. as long as the 3.; hindwing with red discal spots, larger than in the J. South-east Peru (from Chanchamayo southwards) and Bolivia. The Jor common, of the 2 only 1 specimen known (in coll. CHARLES OBERTHÜR).

P. trapeza R & J. (13 c). Forewing narrower in the middle than in *harmodius*, the hindmargin *trapeza*. shorter, a white spot at the hindmargin, not extending to the 2. median; hindwing triangular, sharply dentate, with 2 to 4 red spots from the hindmargin forwards, the posterior spot the largest. Beneath the white hindmarginal spot of the forewing is longer than in all the forms of *harmodius*. \Im unknown. — East Ecuador and North-East Peru.

P. xynias *Hew.* (13 c). Forewing with large pale green area at the hindmargin; hindwing acutely *xynias.* dentate. with short, narrow tail and a few red discal spots posteriorly. Beneath the forewing has a white, very faintly green hindmarginal spot, which is smaller than the spot on the upper surface. No scent-scales. \Im not known. — Eastern slopes of the Andes of Bolivia and Peru.

P. ariarathes. Another widely distributed and very variable species, which has more spiny tibiae and a narrower cell in the hindwing than the allied species. Spots on head and breast yellowish grey. Forewing beneath with 2 red basal spots, the hindwing with 3. In the σ^2 the forewing usually with greywhite or yellowish band or area from the hindmargin forwards; hindwing with red discal spots, of which often only the one placed at the abdominal margin is distinct. 2 almost always with white discal spots on the forewing. Scent-scales of the 57 present. Larva unknown. Colombia to Bolivia, distributed eastwards to Para and Goyaz. The butterfly is individually and geographically variable; the \$\$\varphi\$ resemble the \$\$\varphi\$ of Aristolochia-Papilios and adopt in the different districts their likewise variable dress. The forms all intergrade, We differentiate 6 geographical forms, whether correctly must be ascertained by further ivestigations based on a larger material than we have seen. The butterfly according to Bates flies with great rapidity in sunny places near plantations; it is no rarity, but is not taken in great numbers. - ariarathes Esp. ariarathes. (= acestes Boisd.) (14 a). d: forewing with large white spot from the hindmargin to the 2. median, almost as large beneath as above; on the hindwing 4 to 6 separated discal spots, placed separate from one another and from the cell. 2 with 5 or 6 red discal spots on the hindwing, three long, extending nearly or quite to the cell; in 2-f. ariarathes Esp. the forewing has 1 to 3 white discal spots and often a narrow cellspot; in 2-f. eumelea R. & J. these white spots are only indicated. French and Dutch Guiana. - menes eumelea. R. & J. J. : forewing with white band, extending from the hindmargin to the 1. or 2. median, the posterior menes. spot often small or absent, the spot before the 2. median 4-6 mm. long, also always present beneath; hindwing with 3 or 4 red spots midway between cell and margin. $\stackrel{\circ}{_{\sim}}$ with large discal spot from the 3. radial to the 1. median and a smaller one behind it, sometimes also with indication of spots before the 3. radial and in the cell; 5 or 6 discal spots on the hindwing, remote from the cell. British Guiana. - evagoras evagoras. Gray (13d). T: forewing with narrow band, placed at the 3. radial about midway between cell and outer margin or nearer to the cell; beneath the band is replaced by 2 or 3 distinct spots; discal spot of the hindwing partly near to the cell, the band more curved than in the other forms. 9 with 3 white or yellowish

discal spots and a rather large cell-spot on the forewing; the apical half or two-thirds of the cell of the hindwing red, as are also 6 large discal spots, abdominal margin at least partly red. Venezuela. metagenes. metagenes R. & J. J. is forewing usually with a band reaching from the hindmargin to beyond the 3 radial, merely indicated on the underside; hindwing with 4 or 5 spots placed separate from the cell. 2: forewing with the long white discal band which is also peculiar to the Aristolochia-Papilios P. anchises thelios and P. aglaope, this band consists of two large spots with a smaller one placed before and behind them; hindgayi. wing with 6 red spots, 3 of which are contiguous to the cell. Pará. — gayi Lucas. of and $\hat{\varphi}$ very variable; anargus. 3 principal forms: f. anargus R. & J. (13d), forewing without band or spots; f. cyamon Gray (= charoba *cyamon. Kirby*) (13d), σ with narrow band on the forewing, on the whole somewhat more distally placed than in the σ^2 of evagoras, φ with narrow, indistinct band on the forewing, with cell-spot on the hindwing, the spots on the hindwing sometimes yellowish white; in f. gayi Luc. (= aristagoras Fldr.; arianus Staud.) the d' has on the forewing a more or less square hindmarginal spot, whilst the 2 has 1 or 2 large discal spots, usually also a small third spot and often a cell-spot in addition. These different forms are not separated geographteuctra, ically. Distributed from Colombia to Bolivia and the Amazon downwards to Manáos. - leuctra R. & J. J. J. forewing with a pure white area, of almost even width, reaching from the hindmargin to the 1. median, above about 6 mm. broad and on the underside only a trifle narrower: hindwing with 6 long red discal spots, the 3 middle ones contiguous to the cell. Govaz, Brazil.

P. ilus F. (= hostilius Fldr.; guaco Stgr. (14a). σ^2 : under surface without red basal spots on the ilus forewing, with 4 red basal spots on the hindwing. Forewing with or without a patch in the extremity of the cell, with 2 or 3 white spots on the disc, the posterior one, placed behind the 3. median, the largest. North Venezuela, Northern Colombia, Panama; rare in collections.

P. branchus Doubl. Head and breast with red dots, a spot on the forecoxa white. Wings opaque; forewing with or without white spots; hindwing with broad red discal band. Under surface without red branchus. basal spots on the forewing, with 4 such spots on the hindwing. Sexes similar. In the f. branchus Doubl. belephantes. (14b) the forewing has a variable white central area, which is absent from f. belephantes Godm. & Salv. --Mexico to Costa Rica.

/ belesis. P. belesis Bates (14b). Similar to the preceding species, hindwing with a band of 6 to 7 red spots, parallel to the margin, placed nearer to the margin than to the cell. Forewing in f. belesis Bates without hephaestion. white spot, in f. hephaestion Fldr. with a spot between the 2. and 3. radial and sometimes the indication of a second spot behind the 3. radial. - Mexico to Nicaragua.

P. thymbraeus. The small spots on head and breast grey-yellow, often slightly reddish. Upperside of the wings slightly but yet distinctly metallic blue or green; forewing without markings, but with white fringes; hindwing with a slender tail and 1 or 2 rows of spots between cell and margin. Under surface with red costal basal spot on the forewing and 4 basal spots on the hindwing. Larva on Chirimoya; the thorax dotted with blue and yellow; striped with white and black from the 4. segment backwards, the white stripes with small blue and yellow spots, the sides blue, from the 5. segment dotted with yellow. Pupa green, as in the allied species, appearing constricted at the base of the abdomen. The butterly flies in the open country the whole year through, and is rather common at a height of 500 to 1560 m. --/ thymbraeus. thymbraeus Boisd. (14b) is distributed from East Mexico to Honduras. The hindwing in J and 2 has v aconophos. 2 rows of red spots. - In aconophos Gray the hindwing has only one row of red spots, the discal row is absent. Central and West Mexico.

P. lysithous. A polychromatic species. The different individual forms with one exception were originally described as species and have been regarded as such until recently. The forms are connected with one another by intergradations; moreover, the specific identity of 3 of the varieties (pomponius, rurik, lysithous) has been proved by breeding. Underside of the forewing with 2 red basal spots, hindwing with 3; all the forms with a tail. Larva on Anona, resting by day on the upperside of a leat at the middle vein, on the lower branches and root-shoots. near Petropolis all the year round, except in June and July (middle of the dry season); black with yellow longitudinal stripes and white-yellow saddle-spot. The pupa as in the allied species green with yellow lateral streak. Brazil and Eastern Paraguay. The principal γ platydesma. forms, which do not everywhere occur together, are the following: f. platydesma R. & J. (= harrisianus auct.) (14b), the white band of the forewing very broad, continued over the cell to the costal margin; trarisianus f. harrisianus Swains. (= claudius Boisd.; athous Fldr.), the white band of the forewing broad posteriorly, strongly narrowed anteriorly, not entering the cell, the part from the lower angle of the cell to the costal margin narrow or absent, as in the preceding torm the posterior submarginal spots of the hindwing large; oedipus. t. oedipus Fldr. (= sebastianus Oberth.) (14a), forewing with double spot from the 1. median backwards, / lysithous. hindwing without white band, the 4 posterior submarginal spots large; f. lysithous Hbn. (14a), band of the brevi- forewing narrow, often abbreviated (ab. brevifasciatus Weym.), hindwing with small submarginal spots, the fasciatus, discal band usually only extending to the 1. median, sometimes longer and more distal (ab. extendatus extendatus, discal band usually only extending to the 1, median, sometimes longer and more distal (a). extendatus rurik, Weym.); f. rurik Eschsch. (= rurikia id, in tab., laius Boisd.), band of the forewing abbreviated, hindwing pomponius, without white band, the 4 posterior submarginal spots rather large: f. pomponius Hopff, band of the fore-

wing indicated, or like that of the hindwing entirely absent: f. eupatorion Luc., both wings without discal eupatorion. band, forewing with vellowish marginal band and the marginal spots of the hindwing enlarged (probably an aberration, only the type known, in col. CHARLES OBERTHÜR).

P. asius F. (= astyages Drury; manlius Perty) (14 d). A rather common Brazilian butterfly, distributed asius. from Bahia to Rio Grande do Sul and westward into Eastern Paragnay. A broad band, narrowed towards the costa on the forewing, beginning at the costal margin of the forewing distally to the cell and ending before the abdominal margin of the hindwing; hindwing triangular, with long tail. On the underside the hindwing has 4 red basal spots, two of these placed at the costal margin, in addition a red streak before the abdominal margin and 3 red spots near the anal angle. The 2 similar to the 3° , very rare in collections. The larva not known to us.

Marcellus-Group.

In the marcellus-group there is on the underside of the hindwing a red line running from the costal margin to the anal angle, which at least at the costal margin is edged with black at both sides. The species have bands on the wings, and the triangular hindwing is tailed. The 1. subcostal of the forewing is free; in one species (bellerophon) it is entirely absent.

P. marcellus Cr. (= ajax auct.) (14 c). The common Asimina Swallowtail of North America. Antenna brown-vellow: tibiae and tarsi green: forewing with 8 greenish white bands, the green colour in the membrane: the red line of the hindwing beneath margined with white proximally. Scent-scales of the or long. The larva with 6 fine black transverse lines on each segment, the lines usually partly contiguous. The frontal prominences of the pupa divergent, the thoracic horn vertical, the lateral carina continued to the cremaster. not interrupted. Foodplants: Asimina, especially A. triloba, also Ericaceae and Lauraceae. This species is one of the classical examples of seasonally variable butterflies. In the specimens which hibernate as pupa once or twice the hairs of the frons are long, whilst they are short in the butterflies emerging from non-hibernated pupae. The principal forms are: forma hib. marcellus Cr. (= walshi Edw.), the spring marcellus. 1 form with broad white bands, sometimes red discal spots appearing on the upper surface of the hindwing (ab. abboti Edw.): forma hib. loc. floridensis Holl. is the spring form from Florida, which has broader abboti. black bands than marcellus; forma hib. telamonides Fldr. (14c) is the later spring form, which forms the floridensis. transition to the summer form, forewing somewhat longer than in f. hib. marcellus, the black bands broader, telamonides. the fringes of the tail more extended white; forma aest. lecontei R. & J. (= marcellus auct. non Cramer), lecontei. large, the black bands broad. - P. marcellus occurs from Southern Canada to Florida and Texas and westward into the prairie districts of the Mississippi Plain. Very common where pawpaw trees are found. The flight of the summer brood is more elegant than that of the spring specimens. The butterfly often travels northwards in considerable numbers, flying swiftly near the ground. Indeed in the northern districts where it occurs it is only an immigrant, not a permanent inhabitant.

P. marcellinus Doubl. (= sinon F. non Poda) (14c). Forewing with pale green bands and a row magnetlinus. of submarginal spots: hindwing with black submedian band extending to the black distal margin; the red line on the under surface of the hindwing broad, reaching to the brown margin. Scent-scales of the J long. — Jamaica.

P. celadon Lucas (= sinon Godt. non Poda) (14 c). Similar to the preceding species, but on the celadon. forewing the pale green discal band is continuous with the 3. and 4. pale green cell-bands, not with the 4. and 5.: the red line on the underside of the hindwing thin, shorter than in marcellinus. The anal tergite of the c^{-} is not divided, as the lateral prongs are absent. — Cuba; perhaps also in Florida.

P. zonaria Bilr. (= sinon F. non Poda) (14 c). The pale bands narrow; the 4. and 5. pale green zonaria. cell-bands of the forewing continuous with the discal band, narrow, separated from one another. -- Haiti.

P. philolaus Boisd. (14d). Antenna black; the 7. pale green band of the forewing only represented philolaus. by a spot; hindwing with 2 red spots posteriorly; on the under surface the red line of the hindwing edged with black at both sides, undulate anteriorly. Scent-scales of the or short, broad, irregular, produced in a number of filaments. The 2 in 2 forms: 2 f. philolaus Boisd. similar to the J, the underside paler; 2-f. niger Eimer (= nigrescens Eimer; felicis Frudst.) (14d), the pale green bands of the membrane of the wings uiger. scaled with black, the wings therefore black with slight traces of the bands. - Larva not known. The butterfly common from Mexico to Nicaragua, in low situations, often resting in crowds on the sand at the edge of rivers.

P. xanticles Bates (= plaesiolaus Stgr.) (16b). The pale bands yellow, the 7. band of the forewing xanticles. continuous with the broad discal band, not as in *philolaus* replaced by a single spot. Two forms of the $\hat{\varphi}$; the one similar to the σ , which doubtless exists, has not yet to our knowledge been discovered; the second form. 2-f. philenora Hause (= sheba R. & J.), is black, with the exception of the yellow submarginal and philenora. the red anal spots. Scent-scales of the or as in philolaus. - Panama and at the foot of the Santa Marta in North Colombia.

P. oberthueri R. & J. (14d). Similar to philolaus, the pale bands broader, the white discal area at oberthueri. the 2. median about 1^{1/2} times as broad as the black marginal area; hindwing narrower than in philolaus,

PAPILIO. By Dr. K. Jordan.

the black median band only extending to the cell; the latter less pointed than in *philolaus*. The scent-scales of the 3[°] longer. The 2[°] not known. -- San Pedro Sula, Honduras (in coll. Charles Oberrhüh). Our figure is too small.

P. arcesilaus Lucas (= anaxilaus Fldr.) (14d). Antenna black. Forewing with 6 greenish bands arcesilaus. and a row of submarginal spots, the 6. band short, separated from the discal area. Scent-scales of the σ^2 long. - North Venezuela and Colombia.

P. epidaus. Antenna black; wings white, semitransparent, distally almost glassy. The 2. black band of the forewing extends to the hindmargin beyond the middle and the discocellular band is continued to the 2. median or to the posterior angle of the wing. Larva not known. Mexico to Honduras. epidaus. epidaus Doubl. (15 c). The 2. black band of the forewing not more than half as broad as the light interspace between the 2. and 3. bands, generally narrower, the 5. band not extending far beyond the 2. median, not reaching to the marginal band; the posterior part of the median band, on the underside, thin or merely indicated. From East Mexico to Nicaragua, from whence specimens of this form have recently come. -tepicus. tepicus R. & J. 1. and 2. bands of the forewing broader than in the preceding form, 5. band posteriorly

joined to the marginal band; hindwing longer and the costal margin shorter than in the other forms. West fenochionis. Mexico: province of Jalisco. - fenochionis Godm. & Salv. 5. band of the forewing prolonged to the hinder

angle. hindwing much more extended black than in the previous subspecies. South-Western Mexico: Oaxaca, Guerrero.

bellerophon.

P. bellerophon Dahm. (= coresilaus Godt., swainsonius Swains.) (15 a). The only Papilio in which the 1. subcostal of the forewing is absent. Forewing semitransparent, with 4 black bands. 2 similar to the ♂, with somewhat broader hindwing. Scent-organ of the ♂ woolly. - Brazil: Minas Geraës, Parana, Santa Catarina, rather rare.

Protesilaus-Group.

The species of the following protesilaus-group with the exception of agesilaus are hard to differentiate without the assistance of their genitalia. The red line on the under surface of the hindwing is only edged with black at one side. These white, black-banded butterflies include some of the commonest Papilios of South America; but this applies only to the $\vec{\sigma}\vec{\sigma}$, the $\hat{\varphi}\hat{\varphi}$ on the contrary being very rare in collections. The $\vec{\sigma}\vec{\sigma}$ often rest in dense clusters on damp sand or mud. The larva of only one of the species (*P. stenodesmus*) is known with certainty; it is green, dorsally spotted with black and with transverse bands, sometimes the black markings are absent until a transverse line on the prothorax. The dorsal horn of the pupa is very long. The butterflies are tropical.

P. agesilaus. Easy to recognise by the red line of the hindwing being edged with black distally. Distributed from Mexico to Bolivia and Goyaz in Brazil, not yet known from Nicaragua and Costa Rica, fortis, where, however, the insect certainly occurs. — fortis R. & J. from South-West Mexico: Guerrero, Atoyac, Oaxaca. The black bands broad, 1. and 2. bands of the forewing about $\frac{2}{3}$ as broad as the interspace, both continued to the hindmargin, or the 2. band at least extending beyond the 2. submedian; the white submarginal band not broader than the black postdiscal band, the latter not divided longitudinally by a pale line; abdominal margin of the hindwing black, the two red anal spots surrounded with black. neosilaus. neosilaus Hopf. The black bands narrower than in fortis, the 1. and 2. bands of the forewing at most half as broad as the white interspace, the transparent submarginal band broader than the black postdiscal band; abdominal margin of the hindwing partly white, the red anal spots anteriorly broadly edged with white, much less broadly surrounded with black than in fortis. East Mexico, Guatemala, British Honduras, eimeri. Honduras. — eimeri R. & J. The transparent submarginal band of the forewing between the 4. and 5. subcostal at most as broad as the black postdiscal band which is placed at its proximal side. West Colombia, ragesilaus. upper Cauca Valley and Panama. - agesilaus Guér. (= conon Hew., septemlineatus Eimer) (15c). Postdiscal band of the upperside of the forewing without light median line, narrower than the costal half of the transparent submarginal band; subbasal band of the upper surface of the hindwing only represented by a thin streak placed on the 2. median. Very variable in size. Central and East Colombia, North autosilaus. Venezuela. - autosilaus Bates. Postdiscal band of the forewing divided longitudinally by a pale streak. subbasal band of the hindwing present on the upperside. Orinoco, Guiana, the Amazon, Goyaz, the eastern slopes of the Andes from Ecuador to Bolivia. as well as Paraguay, not yet known from South-East Brazil: like the preceding subspecies very common.

P. glaucolaus. In order to differentiate this and the following species with certainty, it is necessary to compare specimens from the same districts, and at times to take the sexual organs into consideration. In glaucolaus the black postdiscal band of the forewing is widely separated from the lower angle of the cell, or the teeth of the hindwing are very obtuse and the posterior submarginal spots suffused with brown. Scent-scales of the σ^2 as long as in *protesilaus*; the harpe has at the dorsal edge a very long tooth and the central and ventral processes are short, the latter not reaching to the ventral edge of the clasper. From Panama to Guiana. Upper Amazon, southwards to Matto Grosso, not yet known to us from South-East Peru, Bolivia, Paraguay, Brazil proper and the Lower Amazon. Only $\sigma\sigma$ in collections. A common species. glaucolaus. Larva not known. - glaucolaus Bates (15a). Greenish, bands 1 and 2 of the forewing not extended beyond

Publ. 6. VI. 08.

PAPILIO. By Dr. K. JORDAN.

the 2. submedian vein, the 6. band 2 to 3 nm distant from the lower angle of the cell, not narrowed before the 2. radial, the transparent submarginal band at least twice as broad at the 5. subcostal as the black marginal band. Panama; Colombia, with the exception of the province of Cauca, perhaps also in North Venezuela. — melaenus R. & J. The black bands broader than in the preceding form, the transparent melaenus. \checkmark submarginal interspace of the forewing usually only little or not at all broader at the 5. subcostal than the marginal band, in some specimens, however, much broader, in which case the interspace between bands 5 and 6 is narrowed correspondingly. West Colombia and upper Cauca Valley. — leucas k. & J. Wings only teucas, distinctly green towards the base: postdiscal band of the forewing narrowed near the lower angle of the cell and usually before the 2. radial. Hindwing more obtusely dentate than in *protesilaus*, the submarginal spots tinged with brown. 2. band of the forewing from the cell backwards narrower above than beneath, the side of the from white. The harpe of *leucas* more obtuse than in *glaucolaus*, the dorsal tooth narrower and the central process longer. Orinoco, Guiana, the Amazons, East Ecuador, East Peru and Matto Grosso; common.

P. molops. The 1. and 2. black band of the forewing broad and both or at least one of them extending to the hindmargin, the 4, band usually reaching quite across the cell. The denticulate, deflexed dorsal margin of the harper rounded-dilated. φ unknown. Tropical South America, widely distributed, but only singly among the white butterflies of this group. — molops R. & J. Antenna brownish yellow; the molops. black lateral stripe of the abdomen as broad as the yellow-white stripe placed at its dorsal side; 1. and 2. band of the forewing broad, the 1. not extending to the hindmargin, the other bands likewise broad, the 6. especially is broader than in all the other forms of the protesilaus-group, being at least as broad as the interspace between bands 5 and 6; this 6, band close to the lower angle of the cell. Dorsal margin of the harpe abruptly dilated. North-West Ecuador and West Colombia. - hetaerius R. & J. (15b). Easy to hetaerius. differentiate from the preceding form by the thinner black bands; it is so similar to the *protesilaus* forms occurring together with *hetaerius* as to be easily mistaken for them, but is much smaller than the Colombian protesilaus and has a much less sharply dentate hindwing. Sides of the frons always white; 1. and 2. band of the forewing extending to the hindmargin, or the 2. band very little abbreviated; the white submarginal lunule between the 1. and 2. radial of the hindwing narrower than the corresponding marginal lunule; the interspace between the subbasal and median band on the under surface of the hindwing longer than in protesilaus. Harpe somewhat different from the harpe of molops, dorsal and ventral edges more denticulate, the ventral process longer and curved towards the ventral edge of the clasper. Guiana, Amazons, Colombia, Ecuador (except the western side), Peru and Bolivia. - megalurus R. & J. Antenna black as in the megalurus. Brazilian protesilous: from laterally white; the white subdorsal line of the abdomen thin; 1, and 2, band of the forewing extend to the hindmargin, 6. band separated from the angle of the cell; the black markings of the hindwing somewhat more developed than in *hetaerius*, the red anal spot longer; tail long and broad. Dorsal edge of the harpe less dilated than in the other forms of molops. Brazil: Leopoldina, but probably more widely distributed.

P. protesilaus. Submarginal spots of the hindwing white, rarely slightly yellowish, hindwing more strongly dentate than in glaucolaus, the 1. and 2. band of the forewing on the whole shorter than in molops. Frons sometimes entirely brown-black. The scent-scales very long and thin. The dorsal edge of the harpe detlexed, lying flat on the harpe, strongly dentate. Larva not known. Mexico to South Brazil. - penthe-penthesilaus. silaus Fldr. Large; dorsal streak of the abdomen very narrow; 1. band of the forewing extending to the 2. submedian vein, 2. band a little beyond it; 4. band short, triangular, rarely reaching to the 2. cell-fold; 6. band separate from the angle of the cell, somewhat narrowed before the 2. radial, posteriorly almost always separated from the marginal band; red anal spot of the hindwing large, marginal teeth partly strongly projecting, fringes white except a the extremities of the veins. Apex of the harpe pointed, dorsal edge rounded. Mexico, the only form of this group which occurs so far north; it is found in Vera Cruz, Yucatan, Atoyac, Oaxaca etc., in wooded districts, and in the South intergrades completely with the next form. - macrosilaus Gray from Guatemala, British Honduras, Honduras and Nicaragua. t. and 2. bands macrosilaus. of the forewing narrow, the 4. is absent or is only represented by a costal spot, the 6, somewhat angled at the 2. radial and narrowed costad, posteriorly connected with the marginal band; the latter less sharply defined and somewhat paler than in *penthesilous*, transparent, submarginal band with hairy scales; red anal spot of the hindwing narrower than in *penthesilaus*. Apex of the harpe truncate, central process shorter than in the Mexican form, spatulate, strongly dentate at the apex, ventral process not extending to the clasper, curved backwards. - leucones R. & J. Black dorsal line of the abdomen absent or thin; t. band teucones. of the forewing thin, 2. extending to the hindmargin or nearly to it, the interspaces between 1. and 3. of equal breadth at the median vein; the white marginal and submarginal spots of the hindwing large, the margin only black at the extreme tips of the veins, but the fringes from the costa to the 2. radial partly black; red anal spot large. Harpe similar to that of macrosilous, some of the teeth of the ventral edge enlarged, ventral process non-dentate, not extending to the lower edge of the clasper, the teeth of the spatulate central process more or less curved dorsal. Manauré, at the foot of the Santa Marta in North Colombia; probably this form inhabits the north coast of Colombia. — dariensis R. & J. Dorsal line of the abdomen dariensis,

V

6

broad, the margin of the hindwing between costa and 1. radial entirely or almost entirely black. The dilated part of the dorsal edge of the harpe distally with triangular tooth, ventral process denticulate from the base to the tip. Very similar to archesilaus, forewing at the base broader green, the black bands somewhat thinner, band 1 not extending beyond the 2. submedian, band 4 rarely reaching to the 2. cellfold; hindwing less strongly dentate than in archesilaus, the subbasal band of the forewing beneath narrower. Wings of the ² slightly vellowish, especially the anal region of the hindwing. Costa Rica, Panama and the archesilaus islands off the West coast of Panama. — archesilaus Fldr. (= rubrocinctus Eimer partim) (15a). On the whole considerably larger than protesilaus, hindwing more strongly dentate, the apex of the cell of the hindprotestilaus. wing beneath more or less edged with red. Colombia, West Ecuador and North Venezuela. - protestilaus L. (15 c). Bands 1 and 2 of the hindwing usually extend beyond the 2. submedian, band 4 mostly goes beyond the middle of the cell and sometimes reaches to its hinder margin, the transparent submarginal band has at least in the costal third brownish scales; hindwing more strongly dentate than in glaucolaus leucas. Frons in specimens from the Andes often entirely brownish black. Dorsal edge of the harpe dilated into a tooth, which is sometimes absent in specimens from the Andes. Orinoco, Guiana, the Amazon from Pará upwards, nigricornis. and Eastern slopes of the Andes of Ecuador, Peru and Bolivia. - nigricornis Stgr. (= leilus Swains. partim). Antenna usually black; from brownish black, not white at the sides. Dorsal edge of the harpe with large tooth. East Paraguay and Brazil.

helios. P. helios R. & J. (15b). Antenna and frons brownish black as in nigricornis. Wings brownish; fore wing transparent; hindwing more sharply dentate than in *nigricornis*, the black postdiscal band straight, not interrupted posteriorly as in the protesilaus forms, the marginal and submarginal bands yellowish. Under surface more yellow than upper; the red line of the hindwing distally edged with white. Dorsal edge of the harpe not dilated into a large tooth, the apex of the harpe pointed, ventral process not denticulate. — Brazil, only known to us from Parana.

P. orthosilaus Weym. (16c). Antenna yellow-brown, not black. Frons yellowish white at the sides. → orthosilaus. Forewing transparent; hindwing strongly dentate, above also with a median band, the postdiscal band and the black margin merged together into a broad marginal band, the yellowish marginal and submarginal lunules smaller. - Paraguay and Goyaz in Brazil; rare, to our knowledge only 3 or at present known.

P. earis R. & J. (16 a). Antenna dark vellowish brown. From vellowish at the sides. Wings slightly rearis. yellowish, beneath slightly reddish; bands narrow, 4. band of the forewing reduced to a small spot, 6. band close to the lower angle of the cell; the yellowish marginal and submarginal spots of the hindwing narrow, above and beneath smaller than in the name-typical protesilaus; hindwing beneath with long arrow-shaped patch before the abdominal margin, this patch reduced in protesilaus. Dorsal margin of the harpe slightly widened, ventral process non-dentate, not extending to the lower edge of the clasper, central process short, broad, spatulate, strongly dentate. 9 not known. — Eastern Ecuador, probably more widely distributed.

stenodesmus. **P. stenodesmus** R. & J. (15b). Antenna black. Frons laterally white. Forewing distally transparent, the bands thin, interspace between band 1 and 2 half as wide again as that between bands 2 and 3; hindwing longer than in protesilaus and telesilaus, usually slightly yellowish, strongly dentate, median band of the under surface somewhat curved, placed nearer to the extremity of the cell than in protesilaus and telesilaus. Dorsal edge of the harpe not dilated. For larva and pupa see p. 40. — Paraguay; Brazil, from Petropolis to Blumenau; a common species, usually mistaken for protesilaus and telesilaus.

P. telesilaus. Body and wings yellowish; antenna brownish yellow, frons white at the sides; submarginal and marginal spots of the hindwing yellow. Dorsal edge of the harpe slightly or not at all dilated; central process either simple or ventrally denticulate at the base. Scent-scales shorter and broader than in the other species of this group, with the exception of *ogesilaus*. Larva not known with certainty. Panama to South Brazil; the $\sigma\sigma$ very common, often resting together with *protesilaus, agesilaus, glaucolaus,* etc., on *dolius.* damp sand or mud. — **dolius** R. & J. Band 1 of the forewing not prolonged to the hindmargin; margin of the hindwing more extended white than in the next subspecies; subbasal band of the underside of the hindwing not entering the basal cell. Dorsal edge of the harpe only very feebly dentate, scarcely at all

dilated, central process not denticulate ventrally at the base. Panama and West coast of Colombia. telesilaus. telesilaus Fldr. (16a). Band 1 of the forewing continued along the 3. submedian; subbasal band of the hindwing beneath entering the basal cell. Dorsal edge of the harpe dilated, denticulate, central process with dentate ridge ventrally at the base. Central Colombia to Guiana and Pará, distributed southwards to Bolivia, Paraguay and Rio Grande do Sul.

Thyastes-Group.

In the species of the densely scaled thyastes-group the hindwing has on the under surface a red or brownyellow band, which runs about parallel with the outer margin and begins at the costal margin beyond the middle. In all the species the 1. subcostal anastomoses with the costa, which does not occur in the preceding groups.

P. marchandi. Hindwing beneath with brown-yellow discal band. Markings of the upper surface yellow, both wings with yellow discal area and submarginal spots, the area of the forewing continued towards

the costa by several spots. Larva not known. Mexico to West Ecuador. — marchandi Boisd. (16 b). The marchandt. brownish yellow discal band of the hindwing beneath usually curved anteriorly. Discal area of the upper surface of both wings deep dark yellow. Mexico to Honduras, in hilly country, in Guatemala common up to 2500 ft. — panamensis Oberth. The yellow colour on the whole paler than in the northern form, some-panamensis. times pale yellow, the submarginal spots between the 2. radial and the 2. median of the hindwing larger, the discal area of the forewing more deeply idented at the veins. Costa Rica to West Ecuador.

P. thyastes. Forewing with complete or interrupted yellow discal band and hindwing with large yellow discal area; underside of the hindwing with red discal line. Ecuador to Bolivia; Brazil. — thyastinus thyastinus. Oberth. The submarginal spots between the 2. and 3. radial of the forewing separated by a corresponding discal spot, discal band usually interrupted at the 3. radial, the 1. submarginal spot is absent or small. Eastern slopes of the Andes from North Ecuador to Central Peru, Upper Amazon. — zoros R. & J. Like the preceding; zoros. the 1. submarginal spot of the forewing sharply defined; the discal spot between 2. radial and 1. median usually truncate distally, the upper angle not rounded. South-East Peru and Bolivia. — thyastes Drary thyastes. (= diaphorus Hbn.) (16b). Paler yellow than the Andes forms; discal band of the forewing not interrupted, or only very slightly, the submarginal spot between the 2. and 3. radials quite close to the discal spot or partly merged together with it; the black discal area of the hindwing not entering the cell. Southern Brazil, only known from São Paulo to Rio Grande do Sul.

P. dioxippus *Hew.* (16 c). Wings on the upper surface with common green-yellow triangular area; *dioxippus.* forewing with vestiges of costal bands; hindwing with 2 red spots at the anal angle. — Very common in Bogotá-collections; Valleys of the Cauca. Magdalena and Meta Rivers, at moderate elevations. \mathfrak{P} not known.

P. lacandones. The discal area of the forewing extends costad to the lower angle of the cell or beyond it. Guatemala to Bolivia. \mathcal{Q} not known. — **lacandones** Bates from Guatemala and Panama. Fore-*lacandones*. wing with 4 thin submarginal spots, discal area extending anteriorly beyond the 2. radial. — **diores** *R. & J. diores*. (16b). Forewing broader, with 5 submarginal spots which are larger than in the preceding subspecies, discal band not extending beyond the 2. radial, the subapical spot of the cell much smaller than in *lacandones*. Eastern slopes of the Andes of Ecuador, Peru and Bolivia.

P. calliste. Bands and spots of the wings pale yellow or greenish yellow, similarly arranged as in *dioxippus*; submarginal row of the forewing curved; bindwing with 2, rarely 3 red spots, and with 2 very large greenish yellow marginal spots from the 2. radial to the 1. median; underside of the hindwing with pale marginal band. \Re not known to us. Mexico to Costa Rica. — calliste *Bates* (= lorzae *Boisd.*) (16 b). *calliste*. The two outer cell-bands of the forewing clearly developed and the last but two more or less indicated, the discal area emarginate at the cell before the 2. median. Western Mexico, Guatemala and British Honduras. — olbius *R. & J.* Larger than the preceding form; also the outer cell-bands of the forewing suffused with *otbius*. black in the middle; discal hand broader, the black marginal area on both wings consequently narrower than in *calliste*; submarginal line of the forewing only vestigial from the 1. median backwards. Costa Rica.

P. leucaspis. Frons entirely brownish black; abdomen yellowish beneath; the wings with common triangular green-yellow area; the brown marginal area with blackish lines parallel to the margin. \Im not known. Colombia to Bolivia; a very common species in the Andes. — lamis *R. & J.* The posterior cell-spots of the *tamis.* forewing large, very distinct also beneath. Colombia. — leucaspis *Godt.* (16 c). The cell-spots of the fore-*teucaspis.* wing smaller, usually only indicated beneath, the two outer posterior cell-spots more widely separated from one another. Eastern slopes of the Andes, from Ecuador to Bolivia.

Dolicaon-Group.

The 7 following Papilios form the *dolicuon*-group. In these species no red or yellow band is present on the under surface of the hindwing. In some species only the 1, subcostal of the forewing is confluent distally with the costa, whilst in others the 2. subcostal also anastomoses with it.

P. serville. Forewing with broad black cell-band, which runs obliquely from the costal margin to the marginal area, being united with the latter. In the forewing the 1. and 2. subcostal distally confluent with the costa, the 2. subcostal rarely free. $\hat{\varphi}$ not known. North Venezuela, Colombia to Bolivia. Common. — acritus R. & J. The spots on head and breast small, also the yellowish lateral stripe of the abdomen acritus. reduced, these markings sometimes absent; cell of the hindwing usually without blackish streaks. North Venezuela, East and Central Colombia. — serville Godt. (= serville Boisd., boliviana Weeks) (16 c). The serville, spots on breast and head always present, abdomen with 2 yellowish stripes on each side, of which the upper one is broad; cell-streaks of the forewing distinct, the subapical area of the cell always shaded with brown; the pale patches before the margin of the hindwing, on the under surface, more distinct than in acritus. West Colombia and Ecuador to Bolivia.

P. columbus Koll. (= hippodamus Fldr., burtoni Reak.) (16 c). Very nearly allied to serville; the columbus. narrow green costal band of the forewing more oblique than in serville, marginal area of the forewing beneath more purplish white, the blackish lines in it and the yellowish streak on the underside of the

PAPILIO; EURYADES. By Dr. K. JORDAN.

abdominal told of the hindwing less distinct than in *serville*; the black distal area of the hindwing sometimes touches the cell, but does not enter it. Specimens with yellowish instead of deep red anal spot are ab. *fulva*. fulva Oberth. \Im similar to the σ . Cordillera of Bogotá to the West coast of Colombia, North-West Ecuador; common; a \Im in coll. H. J. ADAMS.

mon; a + m con. m. J. ADAMS.

P. orabilis. Club of the antenna black; the black median band of the forewing does not extend to the marginal area, hindwing with long red anal spot, which reaches to the 2. median. 2 not known. orabilis. Guatemala to West Colombia. — orabilis Bibr. The oblique discal band of the hindwing not marked above. isocharis. Costa Rica, Panama and (doubtfully) Guatemala. — isocharis R. & J. (17 a). Median band of the forewing always extending to the 2. median; the black marginal area of the hindwing broader than in orabilis, with an oblique spur pointing forwards, which corresponds to the posterior part of the discal band of the under surface. West Colombia.

salvini. P. salvini Bates (17 b). The black bands very much reduced, a narrow band in the middle of the cell, not extending beyond the median vein; under surface glossy white; hindwing with black-brown discal band which runs almost straight from the costal margin to the red anal spot. 1. and 2. subcostals of the forewing distally confluent with the costa. \Im and larva not known. — Guatemala, British Honduras and (doubtfully) Yucatan; most of the specimens in collections come from the woods in Northern Vera Paz, Guatemala.

callias

as **P. callias** *R. & J.* (= columbus *Hew.* non *Kollar*) (17 a). The short cell-band of the forewing much broader than in *salvini*, the discocellular band also short and broad, confluent with the marginal area at the lower angle of the cell; hindwing shorter than in the preceding species; the marginal tooth placed before the thin tail prolonged, thin. Hindwing beneath with black discal band, divided into two branches at the extremity of the cell; this band in the \mathfrak{P} more distal, placed quite near to the marginal area, with which it is almost confluent. — East Ecuador, Peru and the Amazons.

P. dolicaon. Head and breast black, dotted with white. Black cell-band of the forewing oblique as in *callias*, but still broader than in that species, a macular band between the cell and apex of the wing. Hindwing rounded, with thin tail, beneath with forked discal band, the proximal branch of the fork running to the abdominal margin. The 1. subcostal anastomoses with the costa, 2. subcostal free as in callias. Larva hebrus. not known. Colombia to Paraguay and South Brazil. - hebrus R. & J. The white subapical area of the cell of the forewing narrowed costad; hindwing more strongly rounded than in the other subspecies. Under surface of both wings purplish; the discal area of the forewing divided into spots by broad black veindeileon. streaks; hindwing yellowish. Colombia: Magdalena Valley and Cordillera of Bogotá. - deileon Fldr. (17a). Marginal band of the hindwing beneath narrow below the 1. radial, at the 2. radial only 1-2 mm broad, the proximal branch of the discal band traversing the cell at the base of the 2. median, the greenish white apical spot of the cell much larger than the spot placed at its costal side. East Ecuador to Bolivia and Matto Grosso, and the Amazon downwards to Pará; according to Felder also from "Bogotá", but his spetromes, cimens may be from the East side of the Cordillera of Bogotá or from North-East Ecuador. - tromes R. & J. Green-white subapical area of the cell of the forewing above very faintly shaded with black; marginal band of the hindwing broad, the green-white spots placed at the apex of the cell between the 1. and 3. radials small; marginal band of the underside of the forewing below the 1. radial only about 1 mm broad; the proximal branch of the discal band of the hindwing placed somewhat distally to the base of the 2. median, green-white apical spot of the cell at most as long as the spot placed before it between the dolicaon. 2. subcostal and the 1. radial. North Venezuela. - dolicaon Cr. Marginal band of the forewing beneath at the 2. radial 3-5 mm broad in the \Im , somewhat narrower in the \Im ; proximal edge of the marginal area of the hindwing above remote from the cell; proximal branch of the discal band of the hindwing beneath as in tromes distal to the base of the 2. median vein; the brownish yellow postdiscal spot between the 2. subcostal and 1. radial placed transversely to the veins. Orinoco; Guiana. - deicoon Fldr. The white subapical spots of the forewing large; the black marginal area of the hindwing narrower than in the other

iphitas,

As. P. iphitas *Hbn.* (= dolicaon *Godt.* non *Cramer*) (17 a). Similar to *dolicaon*; yellow, the black marginal area of the forewing narrower posteriorly; the oblique discal band of the hindwing on the upperside present from the black marginal area at least to the 2. subcostal. \Im not known to us. — Brazil, in hilly country: Espiritu Santo, Organ Mountains in the province of Rio de Janeiro, and Pernambuco.

forms. Paraguay; Brazil, from Rio Grande do Sul to Goyaz.

2. Genus: Euryades Burm.

From with short hairs. Tibiae naked, not woolly, furnished with a few bristles; tarsi short. Antenna with strong club and a row of sensory grooves at each side. Stalk of the subcostal fork of the forewing as long as the posterior branch (= 5. subcostal vein), 1. radial before the middle of the cell; basal cell of the hindwing large, 2. subcostal vein very distal, branching from the cell at about the same height as the 2. median, apex of the cell rounded, the lower angle obtuse. The bipartite claspers of the σ not quite

 $\overline{44}$

BARONIA. By Dr. K. JORDAN. - PARNASSIUS. By H. STICHEL.

closed together; the $\hat{\gamma}$ after copulation with so-called pouch. Larva on Aristolochia, and like the pupa, formed and coloured quite as in the Aristolochia-Papilios of the *Papilio perrhebus* group. In these Aristolochia-Papilios we find already a rudimentary pouch; in *Euryades* it is large, bilobate. — This genus is confined to the Rio Parana (with its tributaries), Argentina and Paraguay; 2 species, which are both sexually dimorphic.

E. duponcheli Luc. (17 b). Tailed. σ^3 velvety black, with a yellow band of large patches in the *duponcheti*. middle and on the hindwing also 2 rows of red spots, of which the submarginal row is only more or less indicated above. \Im yellow-brown, black distally and in the cell of the forewing, the macular band above only indicated by 2 subcostal patches, which are situated on the forewing; the red spots of the hindwing above vivid red; under surface for the most part grey-yellow. — From Buenos Aires northward, commonest in North-West Argentina.

E. corethrus Boisd. (17b, c). Tailless. \bigcirc much paler than in *dupoucheli*, semitransparent; hind-*corethrus*. wing also above with a band of yellow spots outside the red discal spots. \heartsuit likewise paler than in the preceding species, the margin more narrowly black, the very pale red submarginal spots of the hindwing large, the discal row on the contrary replaced by black spots, only the last always dotted with reddish grey, but often also the first and sometimes the next two as well. — Not quite so common as the preceding species and not so widely distributed; more in the neighbourhood of the Rio Paraná and Rio Paraguay.

3. Genus: Baronia Salv.

Antenna short, with broad club. Legs likewise very short, femora with long hairs, before the extremity with some stiff bristles, tibiae rough with bristles; 1. segment of the tarsus about $\frac{1}{3}$ as long as the tibia; the spur of the foretibia reaching to $\frac{3}{4}$. Forewing rather narrow, 1. and 2. subcostals close together, the 1. confluent with the costa and partly also with the 2. subcostal, the 3. absent, the 4. and 5. rather long stalked; 1. radial arising from the cell; hindmargin of the cell almost straight, no median spur; hindwing rounded, with large basal cell, the 1. subcostal, which closes it distally, very weak; precostal forked, 2. subcostal branching off much more distally from the cell than the 2. median. Scales of the wings rounded. — The only known species belongs in the neighbourhood of *Parnassius*. — Guerrero, West Mexico.

B. brevicornis Salv. (17 c). Mr. O. T. BARON discovered this peculiar insect in the neighbourhood brevicornis. of the town of Chilpancingo, recently destroyed by an earthquake, where the butterflies were flying in June and July at a height of 4500 ft. He only took 5 specimens, which are in the collections of GODMAN, ROTRICHIED and the California Academy. Blackish brown, with pale yellow markings; all the spots of the hindwing beneath are silvery white as well as the apical and submarginal spots of the forewing. \mathcal{P} somewhat larger than the σ^2 , the light markings more extended.

4. Genus: Parnassius Latr.

For the general characters the reader is referred to the descriptions in Part I, Vol. I, p. 19. A special distinguishing feature of the genus is the absence of the hindmarginal vein in the hindwing and of the transverse vein present in the genus Papilio s. str. between median and submedian near the base of the. forewing. A striking characteristic moreover is the pouch (Abdominaltasche, poche cornée) of the impregnated female, mentioned in Euryades, which besides is only found in a few of the allied genera, namely in Euryaus Boid., Luchdorfia Crüg., also occurring in a single species of the genus Papilio (P. proneus Hbn.) (JORDAN) and in the whole family of Acraeidae. Exhaustive observations and investigations have been devoted to the nature of this appendage. It is not an organ of the body, but a product of the insect itself, and is produced during the copulation of the sexes in this way, that the σ^2 ejects from a gland at the anal extremity a secretion which hardens very quickly, and in the moment of ejection with the assistance of a special membranous organ (peraplast) assumes a definite form and is attached to the abdomen of the φ (SIEBOLD, THOMSON, SCUDDER). This product is therefore an independent creation of the organs of copulation, but its form appears to depend on the peculiar structure of these, and is therefore to be regarded as a valuable means of help in the differentiation of the species and in arranging them into natural groups. Concerning the purpose of this peculiar appendage nothing is known with certainty. One would suppose that it plays some part in oviposition, but this is contradicted by THOMSON'S observations in breeding Parnassius apollo L. in the Insectarium of the Zoological Gardens in London; he is of the opinion that the pouch is without any utility after copulation. The fact that \$\$\$ of Parnussius species have been taken. in the pouch of which a loose egg was found, permits the supposition that the insect carries this with it until it has found a suitable place for laying.

The *Parnassius* forms are inhabitants of the mountains in the Northern temperate zone, entirely wanting in the tropics, subtropics and the Southern temperate zone of America, even in those heights of the Cordillera which would suit their conditions of life. Their area of distribution is confined to a Western strip of North America. As Southern limit about 35° N. Lat. may be taken, in the East the principal chain

PARNASSIUS. By H. STICHEL.

of the Rocky Mountains forming the boundary line, whilst northwards they extend in Alaska as far as the polar circle; in the mountains they ascend to about 4000 m (14 000 English ft.).

America possesses representatives of only two of the groups into which *Parnassius* can be naturally divided according to the abdominal pouch, of which *P. thor, clodius* and the allied forms are to be classified with the Palaearctic *clarius*-group with whitish, elongated, vesicular pouch, whilst the *smintheus* forms belong to the *apollo*-group, in which the pouch is small, dark brown, carinate beneath, and pointed like a leaf.

- *P. eversmanni Mén.* (vol. I, 10g) is represented in Alaska by a form with narrowed bands, to which thor. is to be applied the name of **thor** *H. Edw.*, proposed for the \mathcal{P} . Ground-colour of the σ yellow as in the Asiatic form, markings of the wings agreeing rather closely with those of the \mathcal{P} of *P. clodius*, but the bands and spots narrower, and the discal band outside the cell somewhat further removed from it, less irregular and more sharply defined; the hindwing without submarginal crescents, only 2 indistinct patches near the disc, the basal and hindmarginal area blackish, at the usual places 2 ocelli filled in with red, the posterior one connected with a black anal spot by a narrow band-like shading. \mathcal{P} whitish with broadened bands, the anal spot on the hindwing with two red dots, its connection with the posterior ocellus broader, near the outer margin a row of sharp black lunules. Only 3 specimens (1 σ , 2 \mathfrak{P}) known: at the upper course of the Yucon River, June.
- P. clodius Mén. (17 d) is very nearly allied to eversmanni. Ground-colour white, only in the 2 the clodius. short costal band placed outside the cell connected with the hindmarginal spot by an irregular dusty band, the glossy submarginal band of the forewing sharp but narrow, the σ with small, the φ with larger, crescent-shaped submarginal spots on the hindwing; on the latter the anal spot mostly centred with red. Coast district of Oregon and California, southwards to about San Francisco. The biology is still unknown. It is suspected that Viola is the food-plant, perhaps also Sedum and possibly Vaccinium or Rubus (dewberry) (WRIGHT). Is commonly (even in recent works) confused with the specifically different P. clarius Eversm. attaurus. from Asia, or this name is applied to the mountain form of the species (see further below). - Ab. altaurus Dyar is an aberration from the name-typical form with yellowish instead of red anal spots. - In the Northern adjoining districts occurs a race, larger on the average, with much broadened marginal pattern on the forewing. Marginal and submarginal bands are merged into a broad stripe, through the middle of claudianus. which runs only one row of small white crescents. This form has been introduced as claudianus Stich. (17 c). In the 2 the black band-pattern is less intensive but broader, the connection of the costal spot and hindmarginal spot only shadowed as a narrow streak, on the hindwing very large marginal lunules, the anal spot without red dot. Washington Ter., Vancouver Island, types No. 27918 to 27921 in the Kgl. baldur. Zool. Museum Berlin. There are transitions to the typical form. — baldur H. W. Edw. (17 e) occurs in the mountains to the East of the district of the principal form. This is distinguished by reduced and less sharp markings. In the σ the hindmarginal spot is mostly absent on the forewing and the anal spot on the hindwing; the posterior ocellus is reduced as a rule; the 2 has no submarginal crescents on the hindwing, the anal spot is rarely centred with red; in both sexes the white dusting very thin, somewhat transparent. Sierra Nevada, about from the Emigrant to the Truckee Pass; also reported from the Wahsatch Mountains (Utah). Varies rather considerably, and forms on the one hand transitions to the coast form, on the other hand there occurs a further reduction of the pattern. Specimens with point-like, reduced posterior ocellus lusca, are not rare: ab. lusca Stich. (17 e); or those in which the two ocelli only remain as yestiges: ab. menetriesii menetriesii. H. Edw. (17e). On the other hand ab. lorquini Oberth., in which the ocelli are entirely absent, occurs lorquini. only sparingly. In the type of this form in addition all the black markings also are effaced except two narrow oblong spots in the middle and at the end of the cell of the forewing and some blackish dusting gallatinus. at the hindmargin of the hindwing. - A further race from Montana, gallatinus Stich., is distinguished by the band-pattern of the σ being in general weakly marked, while on the contrary there is a complete discal band outside the cell, as in the \mathfrak{P} of the typical form; hindwing without anal spot and with small ocelli; the 2 is more strongly marked, partly dusted over with black, the forewing with broader submarginal band, on the hindwing the submarginal lunulus and the anal spot strongly developed. Gallatin County (ELROOD).
- smintheus. P. smintheus Doubl. is an American representative of the Asiatic P. phoebus F. Ground-colour chalk-white, forewing with the peculiar black spots of the *apollo*-group, in the typical form an incomplete submarginal band on the forewing, the costal spot faintly centred with red, the transparent border narrow at the outer margin, commonly only extending to the middle of the wing, interrupted by white marginal spots, the white fringes spotted with black at the extremities of the veins; hindwing with 2 small ocelli, filled in with red, hindmarginal spot as a rule weakly indicated. \Im as a rule somewhat larger, forewing with larger ocelli, 1-2 and spots filled in with red, strong hindmarginal spot and broader margin, hindwing with larger ocelli, 1-2 and spots filled in with red arow of submarginal crescent spots. Extraordinarily variable in size and markings, in the \Im the submarginal band of the forewing sometimes more strongly developed, the glassy border very variously developed, the white patches of the same sometimes more

PARNASSIUS. By H. STICHEL.

weakly, sometimes more strongly expressed, occasionally a stronger black spot in the hindmarginal area, the costal spots also quite black, more copiously dotted with red or white; on the hindwing the anal spot in individual instances more distinct and near the margin sometimes some blackish spots. In the P, particulary those from high lying localities, more copious black marking and partial darkening of the white ground-colour are of no uncommon occurrence, also in both sexes individuals often occur with yellowish instead of red ocelli, which are usually referred to behrii (see further below). But this name must be reserved for the Western race of the species. Specimens without red on the upper surface, in which even the ocelli of the hindwing are reduced to black spots, are usually called ab. sedakovii Mén. This is, however, an Asiatic form of P. phoebus F. and the name has been replaced by ab. mendica Stich.

The egg is semispherical, somewhat depressed at the top, the upper surface thickly granulated, the colour ivory white with a faint greenish tint. Development variable, some eggs yield the larvae in the same year, others hibernate. The young larva is nearly cylindrical, of black colour, the body covered with small hairy tubercles. When fullgrown it attains a length of 23-25 mm (0,9-1,1 inch), the groundcolour is then black-brown, brown on the underside and the legs, the body covered with short stiff hairs and marked with 4 rows of yellow, sometimes white spots; it has a fork-shaped, eversible yellowish gland in the neck: the head is broad, with impressed suture, of black colour. Pupa cylindrical, stout, about 15 mm (0.6 inch) long, the upper surface finely granulated, of yellow-brown colour with greenish reflection. When the larva is about to pupate it draws a leaf or several leaves together into a sort of cocoon by some silken threads, but pupae have also been found on the ground under pieces of wood without a trace of a cocoon. Duration of the pupal stage unknown. The time of tlight of the butterflies lasts from May to September, but appears to depend on the temperature and other climatic conditions and the principal time of emergence is the month of July (COURTIS). The oviposition seems to be irregular and regardless of place, and it is left for the newly-emerged larva to find its food-plant; it was observed that the eggs were laid on the stalks of grass or other plants (Composites, Artemisia, etc.), or even on stems or on the ground itself, but always near to this. Various opinions have been advanced as to the food-plant; thus, among others, BRUCE suspected it was Castelleia integra, and also suggested Saxifraga, later he assigned Sedum stenopetalum as the true food-plant; W. H. EDWARDS reared the larvae on Sedum ternatum, but they also accepted other species of Sedum. By night they live concealed in secure hiding-places on the ground, not coming out until the sun shines; they are commonly attacked by parasites (Tachinids). The imagos are common where they occur, but are difficult to catch, not only on account of the natural obstacles of the ground, but also on account of their rapid and high flight. Newly emerged males emit, particularly at the time of copulation, a peculiar, pungent and disagreeable odour, which reminds one of mice (W. H. Edwards, WRIGHT, REAKIRT, FRUHSTORFER, etc.). Habitat of the typical race: the Rocky Mountains in Wyoming and Colorado.

The species is very variable, but according to our experience with the European and Asiatic species the formation of races in certain restricted localities is to be assumed as in the highest degree probable. These races nevertheless intergrade with one another and in the region of flight of the one form are found individuals with characteristics of the others and vice versa, so that the characters assigned to the following forms are only to be taken in a very general sense. In doubtful cases the locality of the insect must settle the question. — As hermodur *H. Edw.* only a strongly darkened form of the σ^2 is usually hermodur. described. The original is recorded from the Southern part of the distribution-area. or (17 e) from that district for the most part differ in that the glossy border of the forewing is not interrupted by white spots at the margin, the submarginal band is only very weakly developed, and the costal spots are occasionally much reduced; \$\$ occur in a more or less darkened form. The name may be applied collectively to the Southern race. South Colorado, Northern New Mexico. - In sayii W. II. Edw. (17d) the Jor are usually sayii. larger, with larger deep red ocelli, and otherwise approach the Asiatic intermedius Mén.; in the 22 as a rule a more copious sprinkling with black scales is noticeable, so that they agree in this with the \$\$\varphi\$ of the previous form; the costal spots of the forewing are large and quite filled in with red, the glossy border broad, only separated from the submarginal band by a row of luniform spots, the submarginal crescents of the hindwing especially strongly marked and merged together into a broad band. Montana, Judith Mountains. - From the Northern parts of the Rocky Mountains there is a smaller form described as nanus nanus. *Neumoeg.* The type-specimen of this resembles the ab. *mendica*; in the σ^{\dagger} the red colour is entirely absent on the upper surface of both wings, the greater part of the outer margin is glassy grey, on the hindwing only the hindmarginal area is blackish and in the disc there is a black spot instead of the ocellus. The $\hat{\varphi}$ is similar to that of *hermodur*, darkly dusted, with 2 costal spots filled in with red, hindwing with glassy grey border, the red ocelli with white pupils, all the black markings vivid. British Columbia and Montana. -In the West the species is represented by behrii W. H. Edw. (17d); a rather large form, in which the of behrii. usually has somewhat longer wings, the submarginal band is marked anteriorly by sharp black luniform spots, which become obsolete posteriorly, the anterior ones of the costal spots usually centred with red, the glossy border is confined to the anterior half, narrowed and so restricted by the white marginal spots that it only remains as a row of blackish wedge-shaped spots; ocelli of the hindwing small. The red-

mendica.

Alphabetical List of the American Papilionidae.

yellow colouring of the ocelli and the development of small submarginal spots on the hindwing are given as special characteristics, but these features are not constant. The \mathfrak{P} as a rule have the costal spots on the forewing strongly filled in with red, a strongly marked submarginal band, the disc more or less dusted with black, on the hindwing the submarginal lunules are confluent as a sort of band and there are grey spots at the margin itself. In aspect on the whole like sayii-2 or a lighter hermodur-2. California (Sierra niger. Nevada), Utah. Ab. niger Wright is an individual form of this local variety corresponding to the ab. mendica; this has on the forewing only two black cell-spots, an insignificant costal spot, traces of a submarginal band, the outer margin has no glossy border, both ocelli of the hindwing are reduced to black magnus. points. Summit, South California, 2600 m. - Another large form of the species is magnus Wright, which is only slightly different from behavii in that the submarginal band of the forewing is almost complete but less sharply marked, and the glassy border is broader, extending to the hinder angle and less restricted by white marginal spots; hindwing in the type-specimen without anal and submarginal spots, the anterior occllus very small, the posterior one also only moderately large, the latter with white pupil, the former entirely red; 2 with costal spots copiously filled in with red and red-dotted hindmarginal spot on the forewing, blackish shading in the disc, border broadly glassy grey; ocelli of the hindwing large, the posterior one with white pupil, submarginal band not extra strongly marked, but the margin itself glassy. Enderby, apricatus. British Columbia. -- The most northerly representative of the species is apricatus Stich. (17d): distinguished by the roundish shape of the wings and very strong black spotting; on the forewing the costal spots changed to a short band, in which there is an almost square red spot anteriorly; submarginal band sharply marhed, a large black spot in the hindmarginal area: on the hindwing the hindmarginal area broadly black. a small anal spot, the ocelli large and filled in with deep red, in the posterior one some white dusting. ♀ similarly marked to the J. somewhat dusted over with blackish, submarginal band of the forewing and the glossy border broader and complete, hindwing with broader submarginal band and blackish glossy border. In general very similar to the Asiatic phoebus forms. Kadiak Island (Alaska).

By older authors (MORRIS, BOISDUVAL) *P. nomion Fisch. d. W.* is recorded from the Rocky Mountains and California, according to more recent accounts (DYAR, WRIGHT) the species occurs in Alaska. However, a more certain confirmation of these records is wanting, and there appears to be a confusion with a form of *smintheus*, especially as regards the records of earlier date.

Alphabetical List

with references to the original descriptions of the forms of the American Papilionidae.

* signifies that the form is also figured in the place cited.

abboti Pap. Mundt. Canad. Entomol. XV, p. 87.	anaximenes Pap. Fldr. Wien. Ent. Mon. VI, p. 64.119
abderus Pap. Hopff. Neue Schmett. II, p. 1. *	anchises Pap. L. Mus. Ulr., p. 191.
acauda Pap. Oberth. Et d'Ent. IV, p. 98. 20	anchisiades Pap. Esp. Ausl. Schmett., p. 53. *
aconophos Pap. Gray. Cat. Lep. Ins. Br. Mus. I, p. 65. *	andraemon Pap. Hbn. Samml. Exot. Schmett. II, Taf. 98. *
acritus Pap. R. & J. Novit. Zool. XIII, p. 735.	androgeus Pap. Cr. Pap. Exot. I, p. 24 *
adaea Pap. R. & J. Novit. Zool. XIII, p. 640.	androna Pap. R. & J. Novit. Zool. XIII, p. 668. *
aeneas Pap. L. Mus. Ulr., p. 197. 7: 4	antheas Pap. R. & J. Novit, Zool, XIII, p. 506.
agathokles Pap. Koll. Denkschr. Akad. Wien. (Math.) I, p. 352.010	antiquus Pap. R. & J. Novit. Zool. XIII, p. 523.
agavus Pap. Drury. Ill. Ex. Ins. III, p. 11. */3	apricatus Parn Stid, Berlin, Ent. Zeitschr. Vol. 51, p. 87, *
agesilaus Pap. Guér. & Perdi. Gen. Ins. Lép. T. I. *	arbatas Pan Cr. Pan Evot IV n 108 *
aglaope Pap. Gray. Cat. Lep. Ins. Br. Mus. I, p. 55. **	areas Pan Cr. Pan Evot IV n 171 *
albanus Pap. Fldr. Verh. ZoolBot. G. Wien XIV, p. 314.	arcesilaus Pap Luc Bey Zool p 131 *
alexiares Pap. Hopff. Stett. Zt. XXVII, p. 31.	archaeilang Don Eldr. Vorb. Zool. Pot. G. Wien VIV p. 301
aliasca Pap. Scudd. Proc. Bost. Nat. H. Soc. XII, p. 407.	archidamac Bon Paind Space Con Lon L p. 291
alopius Pap. Gray. Cat. Lep. Ins. Br. Mus. I, p. 58. PT3.	archutae Pap Honff Statt Zt XVVII p 28
altaurus Parn. Dyar. Bullet. U. S. Nat. Mus., Vol. 52. p. 1.	archytas I ap. Hopff. Stett. Zt. Art II, p. 20.
alunata Pap. Skinn. & Aar. Canad. Entom. XXI, p. 126.	ariaratnes Pap. Esp. Aust. Schniett., p. 57.
alyattes Pap Fldr. Wien. Ent. Mon. V, p. 73.	aristells Fap. Cr. Fap. Exol. IV, p. 155.
amazonius Pap. R. &. J. Novit. Zool. XIII, p. 531.	aristodemus Pap. Esp. Mag. Neu. Ausi. Ins., p. o.
amerias Pap. R. & J. Novit. Zool. XIII, p. 646.	aristor Pap. Goat. Enc. Meth. LX, p. 60.
americus Pap. Koll. Denkschr. Akad. Wien (Math.) I. p. 354.	arrinhue Den Roied Spee Cén Lin L n 202
amisa Pap. R. & J. Novit. Zool. XIII, p. 647.	artipitus Pap. Dotsu. Spec. Gen. Lep. 1, p. 555.
ammoni Pap. Behrens. Canad. Entom. XIX. p. 199.	ascanius Pap. Cr. Pap. Exot. 1, p. 20. 3 P.A.
amosis Pap. Cr. Pap. Exot. III, p. 139. *	ascollus Pap. Flar. Vern. ZoolBot. G. Wien Alv, p. 512.
amphissus Pap. Hopff. Stett. Zt. XXVII, p. 27.	astus Fap. F. Spec. IIIs. II, p. 5.
ampliata Pap. Men. Enum. Corp. anim. Mus. Petr. Lep. II. p. 99.	astomis Pap. Esp. Ausi. Schnett., p. 248.
amunus Pap. Esp. Ausl. Schmett., p. 81. *	autocles Pap. R. & J. Novn. Zool. XIII, p. 557.
anargus Pap. R. & J. Novit. Zool. All, p. 674.	autosnaus Pap. Bates. Trans. Ent. Soc. Lond. (2) V, p. 348.
anatmus Pap. R. & J. Novn. 2001. All, p. 666.	autumnus Pap. Stgr. Iris AI, p. 142.4

Publ. 5. XI. 09.

Alphabetical List of the American Papilionidae.

bachus Pap. Fldr. Verh. zool.-bot. G. Wien XIV, p. 312.
baia Pap. R. & J. Novit. Zool. XIII, p. 614.
bairdi Pap. Edw. Proc. Ent. Soc. Phil. VI, p. 200.
baldur Parn. Edw. Trans. Amer. Ent. Soc. VI, p. 12.
bar Pap. Oberth. Et. d'Ent. IV, p. 72. *0 '5.
baroni Pap. R. & J. Novit. Zool. XIII, p. 647.
behrii Parn. Edw. Trans. Am. Ent. Soc. Lond. (2) V, p. 228.
belephantes Pap. Bates. Trans. Ent. Soc. Lond. (2) V, p. 228.
belephantes Pap. Godm. & Saft. Biol. Centr. Am. II, p. 208. *
belesis Pap. Bates. Trans. Ent. Soc. Lond. (3) I, p. 517.
belts Pap. Cr. Pap. Exot. II, p. 23. *
birchalli Pap. Hew. Trans. Entom. Soc. Lond. (3) I, p. 517.
bitas Pap. Godt. Trans. Entom. Soc. Lond. (2) I, p. 97. *for *
bordotaus Pap. Hew. Trans. Entom. Soc. Lond. (2) I, p. 97. *for *
bordotaus Pap. Hew. Trans. Entom. Soc. Lond. (2) I, p. 97. *for *
bordotaus Pap. Doubl. Ann. Mag. Nat. Hist. XVIII, p. 373.
brasiliensis Pap. Raud. Pack.'s guide Ins., p. 278.
brevicauda Pap. Saud. Trans. Ent. Soc. Lond. 1898, p. 331.
brevifasciatus Pap. Hey. Trans. Ent. Soc. Lond. 1898, p. 331.
brevifasciatus Pap. Hey. Stett. Zg. LV, p. 312.
brises Pap. R. & J. Novit. Zool. XIII, p. 610.
brissonius Pap. Hbn. Verz. bek. Schmett. II, Taf. 103. *72.
burchellanus Pap. Westw. Trans. Ent. Soc. Lond. 1872, p. 101. *f *5 buncheus Pap. Hbn. Sammlg. Exot. Schmett. II, Taf. 108. **(3). burchellanus Pap. Westw. Trans. Ent. Soc. Lond. 1872, p. 101. **(5) cacicus Pap. Luc. Guér. Rev. Zool. (2) IV, p. 132. caliguanabus Pap. Poey, Mem. Hist. Nat. Cub. I, p. 442. * callias Pap. R. & J. Nov. Zool. XIII, p. 739. calicles Pap. Bates, Ent. Month. Mag. I, p. 3. calogyna Pap. R. & J. Nov. Zool. XIII, p. 481. * 'calliste Pap. Bates, Ent. Month. Mag. I, p. 3. calogyna Pap. R. & J. Nov. Zool. XIII, p. 481. * 'calverley' Pap. Grote, Proc. Ent. Soc. Lond. (2) V, p. 361.* calverley' Pap. Grote, Proc. Ent. Soc. Phil. II, p. 441. * canadensis Pap. R. & J. Nov. Zool. XIII, p. 586. capys Pap. Hbn. Sammlg. Exot. Schmett. I. * catametas Pap. R. & J. Nov. Zool. XIII, p. 586. cauca Pap. Oberth., Et. d'Ent. IV, p. 84.* 'catametas Pap. R. & J. Nov. Zool. XIII, p. 616. cauca Pap. Godm. & Sato. Biolog. Rhop. II, p. 235. * chabrias Pap. Hew. Trans. Ent. Soc. Lond. (2) II, p. 23. ** chabrias Pap. Rew. Trans. Ent. Soc. Lond. (2) II, p. 23. ** chabrias Pap. Hew. Trans. Ent. Soc. Lond. (2) II, p. 23. ** chabrias Pap. Rew. Trans. Ent. Soc. Lond. XXX, p. 101. * chironis Pap. R. & J. Nov. Zool. XIII, p. 529. chamissonia Pap. Geisd., Stozeb. Reise III, p. 203. */3 chiansiades Pap. Guen. Mém. Soc. Phys. Genève 22, p. 369. * choridamas Pap. Guen. Mém. Soc. Phys. Genève 22, p. 369. * choridamas Pap. Guen. Mém. Soc. Phys. Genève 22, p. 369. * choridamas Pap. Guen. Mém. Soc. Phys. Genève 22, p. 369. * choridamas Pap. Guen. Mém. Soc. Any. Pet. Lep. I. Suppl., p. 68. * claudianus Parn. Stidt. Wytsm. Gen. Insect. fasc. 58, p. 15. clearchus Pap. R. & J. Nov. Zool. XIII, p. 628. cinyras Pap. Hén. Cat. Lép. Pét. J. p. 73. cleosonelus Pap. Bit., Cat. Lép. Pét. J. 73. * cleosonelus Pap. Bit., Cat. Lép. Pét. J. 74. columbus Pap. Bay. Streek. Proc. Ac. Nat. Sc. Phil. 37, p. 175. cleotas Pap. Bit., Cat. Lép. Pét. J. 73. * closoculis Pap. Bit., Cat. Lép. Pét. J. 73. closoculis Pap. Bit., Cat. Lép. Pét. J. 73. * closoculis Pap. Bit., Cat. Lép. Pét. J. 74. columbus Pap. K. J. Nov. Zool. columbus Pap. Koll. Denkschr. Ak. Wiss. Wien, Math. O. p. 851. *
consus Pap. R. & J. Nov. Zool. XIII, p. 499.⁷ ?
copanae Pap. Reak. Proc. Ent. Soc. Phil. II, p. 141.
correthus Eury. Boisd. Spec. Gén. Lép. I, p. 314. *
correbus Pap. Fldr. Wien. Ent. Mon. V, p. 75.
crassus Pap. Cr. Pap. Exot. II, p. 23. *
crispus Pap. R. & J. Nov. Zool. XIII, p. 525. *
ctesiades Pap. Rist. Nov. Zool. XIII, p. 642.
cutorina Pap. Sign. Inis XI, p. 139.^
cyamon Pap. Gray. Cat. Lep. Brit. Mus. I, p. 60. *
cymochles Pap. Dbl. Ann. Mag. Nat. Hist. 14, p. 416.⁶

daguanus Pap. R. & J. Nov. Zool. XIII, p. 625. damis Pap. R. & J. Nov. Zool. XIII, p. 456.¹¹ damokrates Pap. Guen. Mem. Soc. Phys. Genéve 22, p. 371. */1 dardanus Pap. F. Ent. Syst. III. 1., p. 10.¹¹ (5 dares Pap. Hew. Trans. Ent. Soc. Lond. (3) V, p. 561.¹¹ (5) dariensis Pap. R. & J. Nov. Zool. XIII, p. 716.

dido nor $1 \neq 0.4$ daunus Pap. Boisd. Spec. Gén. Lép. I, p. 342. deileon Pap. Fldr. Verh. zool.-bot. G. Wien 74, p. 300, devilliers Pap. Godt. Mém. Soc. Linn. Paris II, Lép. * diaphora Pap. Stgr. Iris 4, p. 63. diceros Pap. Gray. Cat. Lep. Brit. Mus. I, p. 48. *(diodorus Pap. Hopff. Stett. Zg. 27, p. 23. '3 dione Pap. R. & J. Nov. Zool. XIII, p. 639. diores Pap. R. & J. Nov. Zool. XIII, p. 731. dioxippus Pap. Hew. Ex. Butt. I. * dolicaon Pap. Cr. Pap. Ex. I, Tab. 17. * dolius Pap. R. & J. Nov. Zool. XIII, p. 724. dominicus Pap. R. & J. Nov. Zool. XIII, p. 519. * drucei Pap. Btr. Trans. Ent. Soc. Lond. 1874, p. 434, *(duponcheli Eury. Luc. Ann. Soc. Ent. Fr. 1839, p. 91. * dysmias Pap. R. & J. Nov. Zool. XIII, p. 642. earis Pap. R. & J. Nov. Zool. XIII, p. 723. * ecbolius Pap. R. & J. Nov. Zool. XIII, p. 500. Correct eimeri Pap. R. & J. Nov. Zool. XIII, p. 705. elatos Pap. R. & J. Nov. Zool. XIII, p. 705. elatos Pap. R. & J. Nov. Zool. XIII, p. 481. Pr electryon Pap. Bates. Ent. Month. Mag. I, p. 3. epindaurus Pap. Hew. Exot. Butt. II. * epidaurus Pap. Hew. Exot. Butt. II. * electryon Pap. Bates. Ent. Month. Mag. 1, p. 3. epenetus Pap. Hew. Exot. Butt. II. * epidaurus Pap. Godm. & Satv. Biolog. Lep. Rhop. II, p. 224. * epidaurus Pap. Godm. & Satv. Biolog. Lep. Rhop. II, p. 224. * epidaurus Pap. Godm. & Satv. Trans. Ent. Soc. Lond. 1897, p. 248. ergeteles Pap. Gray, Cat. Lep. Brit. Mus. I, p. 52. * eritamas Pap. Reak. Proc. Ac. Nat. Phil. 18, p. 248. eritamis Pap. Neak. Proc. Ac. Nat. Phil. 18, p. 248. eritamis Pap. Neak. Proc. Ac. Nat. Phil. 18, p. 248. eritamis Pap. Neak. Proc. Ac. Nat. Phil. 18, p. 248. eritamis Pap. Neak. Trons. Ent. Soc. Lond. V, p. 36. * erythrus Pap. R. & J. Nov. Zool. XIII, p. 474. ** etias Pap. R. & J. Nov. Zool. XIII, p. 456. * eucharia Pap. R. & J. Nov. Zool. XIII, p. 456. * eucharia Pap. R. & J. Nov. Zool. XIII, p. 456. * eurysteus Pap. Mösdtl. Verh. zool.-bot. G. Wien 32, p. 304. eurysteus Pap. Mösdtl. Verh. zool.-bot. G. Wien 32, p. 304. eurymander Pap. Hopff. Stett. Zg. 27, p. 29. eurymedon Pap. Lac. Rev. Zool. (2), p. 140. euterpinus Pap. Godu. & Satv. Ann. Mag. Nat. Hist. (4) II, p. 150. evagoras Pap. Gray, Cat. Lep. Brit. Mus. I, p. 61. * extendatus Pap. Weym. Stett. Zg. 55, p. 312.

fenochionis Pap. Godm. & Sato. Ann. Mag. Nat. H. (4) II, p. 150. flavescens Pap. Oberth. Et. d'Ent. IV, p. 79. flavida Pap. Oberth. Et. d'Ent. 4, p. 115. fletcheri Pap. Kenp. Entom. News 11, p. 481. floridensis Pap. Holl. Butt. Book, p. 307. * foetterlei Pap. R. & J. Nov. Zool. XIII, p. 487. $*t^{0}$ /S. fortis Pap. R. & J. Nov. Zool. XIII, p. 704. fulva Pap. Oberth. Et. d'Ent. 4, p. 74.

gallatinus Parn. Stich. Wytsm. Gen. Insect. fasc. 58, p. 15. garamas Pap. Hbu. Samml. Ex. Schmett. III. * garcia Pap. R. & J. Nov. Zool. XIII, p. 592. garleppi Pap. Stgr. Iris V, p. 427. gayi Pap. Luc. Guér. Rev. Zool., p. 193. glaucolaus Pap. Bates. Ent. Month. Mag. I, p. 4. glaucus Pap. L. Syst. Nat. (Ed. X), p. 460. godmani Pap. R. & J. Nov. Zool. XIII, p. 632. gratianus Pap. Hew. Exot. Butt. II. *//p. grayi Pap. Botsd. Spec. Gén. Lép. I, p. 363.

grayi Fap, Boisd. Spec. Gen. Lep. 1, p. 365. haenschi Pap, R. & J. Nov. Zool. XIII, p. 665. * halen Pap. R. & J. Nov. Zool. Soc. Lond. 1882, p. 396. *0/3. halex Pap. R. & J. Nov. Zool. XIII, p. 667. harrisianus Pap. Swains. Zool. Inl. III, Ent. II. * hebrus Pap. R. & J. Nov. Zool. XIII, p. 741. hectorides Pap. Esp. Mag. Ausl. Ins. 1, p. 5. * hedae Pap. Foet. Rev. Mus. Paul. V, p. 620. */ helios Pap. R. & J. Nov. Zool. XIII, p. 720. helianichus Pap. Fidr. Nev. Lool. Jot. G. Wien 14, p. 298. hermodur Parn. Edw., Papilio I, p. 4. hetaerius Pap. R. J. Nov. Zool. XIII, p. 711. * hippason Pap. Hopf, Stett, Zg. 27, p. 26. hippason Pap. Fldr. Vern. Exot. Tagf. I, p. 20. * hippason Pap. Fldr. Wien. Ent. Mon. III, p. 398. hollandi Pap. Edw. Butt. N. Amer. 24, p. 50. 7

v

Alphabetical List of the American Papilionidae.

homerus Pap. F. Ent. Syst. III, 1, p. 29. homothoas Pap. R. & J. Nov. Zool. XIII, p. 561. hyppason Pap. Cr. Pap. Exot. I, p. 46. * idaeus Pap. F. Ent. Syst. III. 1, p. 16. ilus Pap. F. Ent. Syst. III. 1, p. 17. imaus Pap. R. & J. Nov. Zool. XIII, p. 668. * imerius Pap. Godt. Enc. Méth. 9, p. 69. inca Pap. R. & J. Nov. Zool. XIII, p. 653. indra Pap. Reak. Proc. Ent. Soc. Phil. 6, p. 123. interruptus Pap. Stgr. Iris V, p. 427. iopas Pap. Godm. & Salv. Trans. Ent Soc. Lond. 1897, p. 248. iphidamas Pap. F. Ent. Syst. III. 1, p. 17. iphitas Pap. Hun. Samml. Exot. Schmett. II. * isidorus Pap. Dbl. Ann. Mag. Nat. H. 18, p. 375. isocharis Pap. R. & J. Nov. Zool. XIII, p. 738. isus Pap. Oberth. Ét. d'Ent. 4, p. 81. jamaicensis Pap. R. & J. Nov. Zool. XIII, p. 522. janira Pap. R. & J. Nov. Zool. XIII, p. 527. jelskii Pap. Oberth. Et, d'Ent. 6, p. 118. * judicaël Pap. Oberth. Ét. d'Ent. 12, p. 3. * klagesi Pap. Ehrm. Entom. News XV, p. 215. Clip. klagesi Pap. Ehrm. Entom. News XV, p. 215.¹⁷⁷⁻ lacandones Pap. Bates. Ent. Month. Mag. 1, p. 4. lacydes Pap. Hew. Equat. Lep. 1, p. 1.¹⁷⁷⁻ lamarchei Pap. Stgr. Iris V, p. 428. lamis Pap. R. & J. Nov. Zool. XIII, p. 733. laodamas Pap. Fldr. Wien. Ent. Mon. Y, p. 72. lecontei Pap. R. & J. Nov. Zool. XIII, p. 690. lenaeus Pap. Dbl. & Hew. Gen. Diurn. 1, p. 16. * leontis Pap. R. & J. Nov. Zool. XIII, p. 690. lenaeus Pap. Dbl. & Hew. Gen. Diurn. 1, p. 16. * leontis Pap. R. & J. Nov. Zool. XIII, p. 690. lenaeus Pap. R. & J. Nov. Zool. XIII, p. 599. lepidus Pap. Fldr. Wien. ent. Mon. Y, p. 72. letalea Pap. R. & J. Nov. Zool. XIII, p. 620. * leucaspis Pap. Godt. Enc. Méth. 9, p. 55. leucares Pap. R. & J. Nov. Zool. XIII, p. 709. * leucaspis Pap. Godt. Enc. Méth. 9, p. 55. leucares Pap. R. & J. Nov. Zool. XIII, p. 457. *¹⁷ h. lorguini Pam. Oberth. Ét. d'Ent. 14, p. 7. * lucianus Pap. R. & J. Nov. Zool. XIII, p. 518. 'lycidas Pap. R. & J. Nov. Zool. XIII, p. 518. 'lycidas Pap. Cr. Pap. Exot. II, p. 25. 'lycomenes Pap. R. Samml. Exot. Schmett. II. * lysander Pap. Cr. Pap. Exot. I, p. 46. 'lysander Pap. Cr. Pap. Exot. I, p. 46. 'lysinhous Pap. Hbm. Samml. Exot. Schmett. II. * 'lysinhous Pap. Hbm. Samml. Exot. Schmett. II. * Iysithous Pap. Hon. Samml. Exot. Schmett. II. * machaonides Pap. Esp. Ausländ. Schmett., p. 191. * macrosilaus Pap. Gray, Cat. Lep. Brit. Mus. I, p. 34, madyes Pap. Dbl. Ann. Mag. Nat. H. 18, p. 375. magnus Parn. Wright. Butt. West Coast U. S., p. 80. * marcellinus Pap. Cr. Pap. Exot. II, p. 4. * marchandi Pap. Boisd. Spec. Gen. Lép. 1, p. 350. marcius Pap. Hon. Samml. Exot. Schmett. 1. * . . . megalurus Pap. R. & J. Nov. Zool. XIII, p. 719. * melasina Pap. R. & J. Nov. Zool. XIII, p. 719. * melasina Pap. R. & J. Nov. Zool. XIII, p. 542. melonius Pap. R. & J. Nov. Zool. XIII, p. 556. * mendica Parn. Stid., Wytsm. Gen. Insect. 58, p. 20. menerifiesi Parn. Edw. Proc. Cal. Ac. Sci. 7, p. 164. metagenes Pap. R. & J. Nov. Zool. XIII, p. 673. metagenes Pap. R. & J. Nov. Zool. XIII, p. 673. metagenes Pap. R. & J. Nov. Zool. XIII, p. 673. metagenes Pap. R. & J. Nov. Zool. XIII, p. 673. metaphaon Pap. Burn. Descr. Rép. Arg. V. Lép., p. 63. * mitrodamas Pap. R. & J. Nov. Zool. XIII, p. 673. montezuma Pap. R. & J. Nov. Zool. XIII, p. 673. montezuma Pap. K. Strow. Zool. XIII, p. 673. mortica Pap. R. & J. Nov. Zool. XIII, p. 673. motice Pap. R. & J. Nov. Zool. XIII, p. 673. motice Pap. R. & J. Nov. Zool. XIII, p. 673. motice Pap. R. & J. Nov. Zool. XIII, p. 673. motice Pap. R. & J. Nov. Zool. XIII, p. 674. montezuma Pap. Westw. Are. Ent. I, p. 67. * P. 2, mortelius Pap. R. & J. Nov. Zool. XIII, p. 635. mycale Pap. Godn. & Sadv. Biolog. Rhop. II, p. 199. *¹¹³⁸ mylotes Pap. Bates. Trans. Ent. Soc. Lond. (2) V, p. 346. nais Pap. R. & J. Nov. Zool. XIII, p. 653. nais Pap. R. & J. Nov. Zool. XIII, p. 653. nanus Parn. Neumoeg. Entom. Amer. 6, p. 61. nealces Pap. R. & J. Nov. Zool. XIII, p. 558. neodamas Pap. Luc. Guér. Rev. Zool. (2) 4, p. 193. *

neophilus Pap. *Hbn.* Verz. bek. Schmett., p. 87. ¹⁹ neosilaus Pap. *Hopff.* Stett. Zg. 27, p. 26. nephalion Pap. *Godt.* Enc. Méth. 9, p. 37. niger Pap. *Eimer,* Artbild. Schmett., p. 214. niger Parn. *Wright,* Butt. West Coast U. S., p. 79. * nigricornis Pap. *Stgr.* Exot. Tagf. 1, p. 17. nitra Pap. *Edw.,* Papilio III, p. 158. numa Pap. *Boisd.* Spec. Gén. Lép. I, p. 289. ⁶ 15 nymphius Pap. *R. & J.* Nov. Zool. XIII, p. 612. * oberthueri Pap. R. & J. Nov. Zool. XIII, p. 696. * obsoleta Pap. Ehrm. Canad. Entom. 32, p. 348. oebalus Pap. Boisd. Spec. Gén. Lép. 1, p. 360. oedippus Pap. Luc. Casteln. Voy. Amér. Sud, Lép., p. 197.¹¹ oedipus Pap. Ridr. Verh. zool.-bot. G. Wien. 14, p. 299. olbius Pap. R. & J. Nov. Zool. XIII, p. 732. olivencius Pap. Bates. Trans. Ent. Soc. Lond. (2) V, p. 345.^{6,19} orabilis Pap. Btr. Cist. Ent. I, p. 84. orbignyanus Pap. Lyc. Rev. Zool. (2) 4, p. 192. *¹⁷ orchamus Pap. Bates. Trans. Ent. Soc. Lond. (2) H, p. 23, *^{6,19} oregonia Pap. Hew. Butt. N. Amer. II. * oreliana Pap. Hew. Trans. Ent. Soc. Lond. (2) II, p. 23, *^{6,19} ornythion Pap. Bates. Spec. Gén. Lép. I, p. 354. orrentan Pap. *Hew.* Trans. Ent. Soc. Lond. (2) 11, p. 25. "We ornythion Pap. *Boist.* Spec. Gen. Lép. 1, p. 354. orsua Pap. *Godm. & Salv.* Ann. Mag. Nat. H. (6) III, p. 358. orthosilaus Pap. *Weym.* Entom. Nachr. 25, p. 195. osyris Pap. *Fldr.* Wien. Ent. Mon. 5, p. 74. oviedo Pap. *Gundl.* Poey Rep. Nat. Cub. I, p. 279. * oxynius Pap. *Hbn.* Saml. Exot. Schmett. III. * oviedo Pap. Gurdt. Poey Rep. Nat. Cub. I, p. 279. *
ovynius Pap. Hön. Saml. Exot. Schmett. III. *
pacificus Pap. R. & J. Nov. Zool. XIII, p. 612. *
paeon Pap. Boisd. Spec. Gèn. Lép. I, p. 36. *
palamedes Pap. Druy, III. Ex. Ent. I, p. 38. *
palamedes Pap. Druy, III. Ex. Ent. I, p. 38. *
palamedes Pap. Druy, III. Ex. Ent. I, p. 38. *
patamensis Pap. Debrth. Et. Lem. I, p. 75. *
paransis Pap. Bates. Journ. Ent. I, p. 225. *
paralius Pap. R. & J. Nov. Zool. XIII, p. 474. *
paraensis Pap. Debrth. Et. J. Drus. Ent. I, p. 425. *
paransis Pap. Bates. Journ. Ent. I, p. 225. *
paralius Pap. R. & J. Nov. Zool. XIII, p. 638. *
parianus Pap. R. & J. Nov. Zool. XIII, p. 474. *
parianus Pap. R. & J. Nov. Zool. XIII, p. 602. *
parsodes Pap. Bates. Trans. Ent. Soc. Lond. (2) V, p. 344.0.*
patros Pap. Gray, Cat. Lep. Brit. Mus. I, p. 43. *
pausanias Pap. Hæv. Trans. Ent. Soc. Lond. (2) V, p. 344.0.*
perfesinus Pap. Edv. Proc. Col. Ac, Sci. V, p. 423. *
peleides Pap. Esv. Hus. Schmett., p. 150. *
perthesis Pap. Bates. Trans. Ent. Soc. Lond. 1869, p. 32. *
phalascus Pap. Hæv. Trans. Ent. Soc. Lond. 1869, p. 32. *
phanas Pap. R. & J. Nov. Zool. XIII, p. 575. *
phana Pap. R. & J. Nov. Zool. XIII, p. 575. *
phana Pap. R. & J. Nov. Zool. XIII, p. 575. *
phana Pap. Boisd. Spec. Gén. Lép. I, p. 319. *
pharax Pap. Godm. & Satv. Biolog. Rhop. II, p. 211. *
pharax Pap. Boisd. Spec. Gén. Lép. I, p. 236. *
philetas Pap. Hew. Trans. Ent. Soc. Lond. 1869, p. 31. *
philocleon Pap. Fldr. Verh. zool-bot. G. Wien. 14, p. 218. *
philocleon Pap. Boisd. Spec. Gén. Lép. I, p. 256. *
phosphorus Pap. Bates. Trans. Ent. Soc. Lond. 20. V, p. 342. Pib
phosinus Pap. Boisd. Spec. Gén. Lép. I, p. 369. *
philotas Pap. R. & J. Nov. Zool. XIII, p. 679. *
<

Alphabetical List of the American Papilionidae.

ptilion Pap. R. & J. Nov. Zool. XIII, p. 602. pyromelas Pap. R. & J. Nov. Zool. XIII, p. 456.

quadratus Pap. Stgr. Iris III, p. 337. *

radiatus Pap. *Streck*. Lep. Rhop. Illst. Suppl. III, p. 17. rhipidius Pap. *R. & J.* Nov. Zool. XIIII, p. 533. * rhodostictus Pap. *Btlr. & Druce*. Proc. Zool. Soc. Lond. 1874, 364. rogeri Pap. Boisd. Spec. Gén. Lép. I, p. 278. rosenbergi Pap. Druce. Ann. Mag. Nat. H. (7) 12, p. 221. rurik Pap. Eschsch. Kotzeb. Reise III, p. 202. rutulus Pap. Luc. Guér. Rev. Zool. (2) 4. p. 158. sadyattes Pap. Druce. Ent. Month. Mag. 11, p. 36.⁶ salvini Pap. Bates. Ent. Month. Mag. 1, p. 4. sayii Parn. Edw. Proc. Ent. Soc. Phil. II, p. 78. scamander Pap. Boisd. Spec. Gén. Lép. I, p. 363. serapis Pap. Boisd. Spec. Gén. Lép. I, p. 298.⁶17. serville Pap. Godt. Enc. Méth. 9. Suppl., p. 809. sesostris Pap. Cr. Pap. Exot. III, p. 34. *⁶1¹⁵ smintheus Parn. Dhl. & Hew. Gen. Diurn. 4. * specularis Pap. R. & J. Nov. Zool. XIII, p. 457. spoliatus Pap. R. & J. Nov. Zool. XIII, p. 542. steinbach Pap. Rotsch., Entomol. 1905, p. 125. *⁷⁴ stendesmus Pap. R. & J. Nov. Zool. XIII, p. 722. * streckerianus Pap. Honr. Berl. Ent. Zeitschr. 28, p. 395. * syedra Pap. Godm. & Sato. Proc. Zool. Soc. I. 1878, p. 271.

syedra Pap. Godm. & Salv. Proc. Zool. Soc. I. 1878, p. 271. syndemis Pap. Jord. Seitz, Macrol. 5, p. 33.

tailori Pap. R. & J. Nov. Zool. XIII, p. 571. tarquinius Pap. Boisd. Spec. Gén. Lép. I, p. 296. \pm tasso Pap. Stgr. Exot. Tagf. I, p. 19. * telamonides Pap. Fldr. Verh. zool.-bot. G. Wien. 14. p. 303. telesilaus Pap. Fldr. Verh. zool.-bot. G. Wien. 14. p. 301. tementes Pap. R. & J. Nov. Zool. XIII, p. 482. $\theta^{1/7}$ tepicus Pap. R. & J. Nov. Zool. XIII, p. 482. $\theta^{1/7}$ texanus Pap. Gray. Cat. Lep. Brit. Mus. I, p. 52. $\ast^{\theta^{1/7}}$ therapes Pap. R. & J. Nov. Zool. XIII, p. 643. therase Pap. R. & J. Nov. Zool. XIII, p. 641. therase Pap. Rett. Tans. Ent. Soc. Lond. (2) 1, p. 97. thoantiades Pap. Hew. Trans. Ent. Soc. Lond. (2) 1, p. 97.

thoantiades Pap. Burn. Descr. Rép. Arg. V. Lép., p. 59. * thoas Pap. L. Mant. Plant., p. 536. \rightarrow thor Parn. Edw. Papilio 1, p. 4. thrason Pap. Fldr. Verh. zool.-bot. G. Wien. 14, p. 309.

thyamus Pap. R. & J. Nov. Zool. XIII, p. 523. thyastes Pap. Drury. III, Ex. Ins. III, p. 47. * thyastinus Pap. Oberth. Et. d'Ent. 4, p. 75. * thymbraeus Pap. Boisd. Spec. Gén. Lép. 1, p. 302. timias Pap. Gray. Cat. Lep. Brit. Mus. 1, p. 50. * tolmides Pap. Godm. & Salv. Biolog. Rhop. II, p. 299. * tolus Pap. Godm. & Salv. Biolog. Rhop. II, p. 299. * torquatus Pap. Cr. Pap. Exot. II, p. 123. * trapeza Pap. R. & J. Nov. Zool. XIII, p. 669. * trichogus Pap. R. & J. Nov. Zool. XII, p. 479. triobas Pap. Codt. Enc. Méth. 9, p. 33. * l_1 tromes Pap. R. & J. Nov. Zool. XIII, p. 742. tromes Pap. R. & J. Nov. Zool. XIII, p. 526. turnus Pap. L. Syst. Nat. (Ed. XI), p. 751.

ulopos Pap. Gray. Cat. Lep. Brit. Mus. I, p. 69.

varus Pap. Koll. Denkschr. Ak. Wiss. Wien, Math. I, 354. * vertumnus Pap. Cr. Pap. Exot. III, p. 32. * ℓ/ℓ victorinus Pap. Dbl. Ann. Mag. Nat. H. 14, p. 418. vilcanotus Pap. R. & J. Nov. Zool. XIII, p. 643. vincentius Pap. R. & J. Nov. Zool. XIII, p. 517. * vincgnius Pap. R. & J. Nov. Zool. XIII, p. 517. * virginia Pap. Krb. Trans. Ent. Soc. Lond. 1881, p. 352. vulneratus Pap. Btlr. Cist. Ent. I, p. 85.

warscewiczi Pap. Hopff. Stett. Zg. 27, p. 29. wasmuthi Pap. Weeks. Journ. N. York Ent. Soc. G., p. 82. *

xanthias Pap. R. & J. Nov. Zool. XIII, p. 464. *^(f, f) xanthopleura Pap. Godm. & Sato. Ann. Mag. Nat. H. (4) II, p. 150. xanticles Pap. Bates. Proc. Zool. Soc. Lond. 1863, p. 241. * xenarchus Pap. Hew. Exot. Butt. II. * xenarchus Pap. Hew. Trans. Ent. Soc. Lond. (3) 5, p. 561. xenodamas Pap. Hbn. Saml. Exot. Schm. II. * xynias Pap. Hew. Ent. Month. Mag. 12, p. 153.

vuracares Pap. R. & J. Nov. Zool. XIII, p. 469. P .o

zacynthus Pap. F. Ent. Syst. III. 1, p. $15.^{5/19}$, zaddachi Pap. Dewitz, Mitt. München. Ent. Ver. I, p. 85. * zagreus Pap. Dbl. Ann. Mag. Nat. H. 19, p. 174. zalates Pap. Godm. & Salv. Biolog. Rhop. II, p. 233. * zelicaon Pap. Luc. Guér. Rev. Zool. (2) 4, p. 136. zestos Pap. Gray. Cat. Lep. Brit. Mus. 1, p. 47. * $1^{+1/2}$ zetes Pap. Westw. Trans. Ent. Soc. Lond. V, p. 36. * zeuxis Pap. Luc. Guér. Rev. Zool. (2) 4, p. 190. $1^{-1/2}$ zonaria Pap. Bttr. Cat. Diurn. Lep. Descr. Fabr., p. 240. zoros Pap. R. & J. Nov. Zool. XIII, p. 729.



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PIERIDAE. By J. Röber.

2. Family: Pieridae, Whites.

In comparison with the other faunistic regions, America shows a great abundance of genera. Of the 40 odd genera of Pierids represented in this region 28 have no representatives in other regions, whilst of the 23 Palaearctic genera only 12, of the 14 Indo-Australian only 4 and of the 13 African genera also only 4 are not represented in other faunistic regions. The American Pierid-fauna has consequently quite a character of its own, so much the more as several of the endemic genera are very rich in species and the species for the most part show a great abundance of individuals. Of the 28 American genera only one (*Neophasia*) is confined to North America (accepting the Tropic of Cancer as its southern boundary), and even this wears the garb of allied Palaearctic and Nearctic members of this family, whilst the remaining 27 genera are indigenous to South America. Of these again 3 genera inhabit exclusively the high mountain ranges, 1 genus (*Tatochila*) are island-dwellers. North America is relatively poor in species of Pierids, since it only possesses about 50, the Palaearctic Region on the contrary showing about three times as many. The whole of the genera which are represented in North America, but yet are not peculiar to this region, occur also in the Palaearctic Region, with one exception (*Nathalis*).

Although the great majority of the American species only belong to the medium-sized butterflies, yet the genera *Catopsilia*, *Amynthia* and *Gonepteryx* show also species which are not inferior in size to the largest forms of this family from other regions. Though there is no large number of species in America which equal in the beauty of the colour of the wings especially Oriental Pierids, the American Region is not wanting in strikingly beautiful forms.

Whilst the other faunistic regions can only show a very small number of Pierid-species which pass as so-called mimics (species of *Pareronia*), tropical and subtropical America possesses a great abundance of them, as for example numerous species of the genera *Dismorphia*, *Pereute* and *Archonias*, which show socalled mimicry in both sexes, whilst in the genus *Perrhybris* only the \mathfrak{P} of some species exhibit this convergent development, the $\sigma\sigma$ of only a few species having on the underside indications of a resemblance to protected species of other families. Not only these, however, but also species of the genera *Pieris*, *Tatochila*, *Dismorphia*, *Pereute*, *Hesperocharis*, *Appias*, *Terias*, *Catopsilia*, *Euchloë*, *Anthocharis* etc., show striking sexual dimorphism. Seasonal forms occur in North America much as in the Palaearctic Region, in the tropical part of South America on the contrary they are practically non-existent on account of the want of sesonal changes. Sharply defined local forms could only be developed to a very small extent owing to the geographical conditions of the region; on the other hand the high mountain-ranges of South America show a fauna of their own, whilst the large steppe-district in the most southerly part has some forms in common with the south of North America as well as a few endemic ones.

Most of the American Pierids are not rare, many are even very common, although in comparison with the richness in species and individuals of some other families of Lepidoptera they are not so conspicuous as in the Palaearctic Region. Frequently large swarms of different species have been observed, even of such as are by no means of common occurrence. Thus among others at the beginning of October 1874 on the Bermuda Islands an immense swarm of *Terias Isa* was observed, thousands of which fell victims to the birds; these small butterflies flew further westward and had to travel about 600 miles to the next resting-place (Cape Hatteras). The larvae of some species of Pierids on account of their abundant occurrence do serious damage to field and garden plants both in North and in tropical America; the north of the United States has a dangerous enemy to the pine-forests in *Neophasia menapia*, and *Pieris rapae*, which was introduced into North America about 1860, has increased to such an extent that it does even greater damage there than in its original habitat, the Palaearctic Region.

In general the Pierids are of medium size, but some species are large butterflies. The main character of the pattern consists in white colouring with dark, blackish stripes and spots; yet there are also, particularly among the Exotics, a large number of species which in the size of the wings and the gorgeousness of the colours equal the most beautiful forms of other families of Lepidoptera. In these brightly coloured species the contrast between upper and under surface is very striking. Whilst a large part of the species have on the whole the characteristic marking of the family (white-black), there are among the tropical species also many with yellow, blue, red or black ground-colour on the upperside, and on the other hand some with white upper, but variegated under surface. Thus the South American Perente-species, with their black ground-colour and red bands on the forewing both above and beneath, completely belie their Pierid nature, and Archonias critias and allied species resemble the species of the aeneas-group of the South American Papilios.

PIERIDAE. By J. Röber.

Sexual dimorphism is well developed in many species from all the faunistic regions, seasonal dimorphism naturally only in those species which inhabit districts with sharply marked seasonal changes.

Antennae of varying lengths, e. g. in Leptidia rather short, in the South American genus Leptophobia on the contrary very long, the club clearly defined or gradually thickened. Forelegs normally developed, therefore capable of use, with bifd claws. Proboscis well developed. The butterflies feed at flowers and moist places on the ground. Palpi well developed, but variable. Male secondary sexual characters (seent-organs) occur in the species of several genera, e. g. in Colias as a specially scaled spot on the hindwing, in Catopsilia as broad patches of thick scaling, in Appias (Tachyris) as a pencil on the underside of the abdomen, in Dismorphia as large chalky spots of scales on the under surface of the forewing, from which the scent is given off by rubbing against the strongly widened anterior part of the hindwing. Other species (e. g. Pieris brassicae and its allies) possess feather-brush scales (Aurivilius), which are extended over the greater part of the wing and apparently are the cause of the suppression of the dark markings in the $\sigma^* \sigma^*$, and other species again (e. g. Pieris braniae from South America) broad stripes of thick chalky scales along the veins.

The Pierids — like most *Rhopalocera* — are sun-loving insects, but, in common with a few other butterflies (mostly Satyrids), nevertheless extend into the Arctic, Antarctic and Alpine regions, without losing anything in brilliancy of colouring in comparison with allied genera from warmer districts. The high mountains of South America and the south-eastern boundary of the Palaearctic Region each even possess two genera quite peculiar to themselves, namely the former *Phulia* with about six species and *Andina* with one *Colius*-like species, and the latter *Mesapia* and *Baltia*, of which the last-named is very nearly allied to *Phulia*.

The Pierids are as a rule moderate fliers, but some also fly unusually swiftly (*Appias*) and others so slowly that they can be caught with the hand when on the wing (*Leucidia*). They occur in one or more generations.

The intellect is obviously very different in the various Pierids, for whilst for instance *Pieris brassicae* and the *Colias*-species are capable of very quickly recognising danger when pursued by the collector, this is much less to be observed in others (*Pieris napi* and *rapae*).

The swarming and migration of the butterflies, already referred to, have been regarded as nuptial flights; Catopsilias and *Pieris brassicae* especially have been observed to form such swarms.

The eggs are oblong, are laid in an upright position singly or in clusters, sometimes in large numbers, on the underside of the leaves of the food-plant, and are of different colours.

The larvae are cylindrical, mostly of green or greenish ground-colour with light longitudinal stripes and short hairs; none have yet been observed with spiny or such like processes. They do not possess the fork on the neck characteristic of the Papilionid larvae, which is said to afford the insects protection from their enemies by the emission of an unpleasant odour, neither has it been proved that — like many Papilionid larvae — they acquire poisonous or at least nauseous properties from their food; nevertheless they are not only unpalatable to birds, but is has also been observed that fowls which had been fed on these larvae died, evidently in consequence of a poison contained in their bodies. They live on various shrubs and herbaceous plants, such as Papilionaceae, Mimosas, Crucifers and Caparideae.

The pupa is attached to plants etc., by its abdomen, in an upright or hanging position, and is held in this position by a girth. Some are of very singular form, such as the tube-shaped pupae of the species of Anthocharis; but in general the Pierid pupae show few differences. The Palaearctic Zegris eupheme and probably not only the other Palaearctic species (Z. fausti), but also the North American Z. olympia pupates in a rather thick cocoon, but still possesses a remnant of the girth. This characteristic (recalling the »Bombycids«) is much more pronounced in the Mexican Eucheira socialis. The larvae of this species are gregarious and go out at night in a procession to feed. The common web hangs down from a bough, in the form of a pouch; the pupae are fastened in it head downwards (J. ALEMAN).

Some of the Pierids hibernate as pupae, some as larvae, and some — e. g. the Palaearctic Gonep-teryx-species — as butterflies.

In the Palaeartic and Nearctic Regions the Pierids preponderate by their great number of individuals, in the tropics they are more restricted. Some Pierids have a very extensive range, thus *Pieris rapae* and *napi* occur in the whole Palaearctic and the Nearctic Regions, *Belenois mesentina* in the southern Palaearctic, Indian and African Regions.

Although — as already mentioned — the larvae do not appear to absorb poison from their foodplants, the butterflies are very little pursued by the birds, and are therefore apparently unpalatable to them or at least not much appreciated.

Several fossil Pierids have been found, which do not differ in size from the present-day species.

NEOPHASIA; EUCHEIRA; TATOCHILA. By J. Röber.

1. Genus: Neophasia Behr.

This genus is nearly allied to the Palaearctic *Aporia Hbn.* It differs principally in the direction of the precostal, which is not straight, but curved slightly inwards, the longer and slenderer palpi and the more distinctly clubbed antennae. The costal of the forewing only extends a little beyond the middle of the costal margin. the subcostal is four-branched with two branches before the closing nervure of the median cell, the third and faurth branches form a short fork and the third runs to the apex. The upper radial is coincident with the subcostal almost to one-half, hence the upper discocellular is wanting. The middle and lower discocellulars are about equal in length, the former is curved inwards, the latter is straight and closes the middle cell, joining the third median*) in an acute angle at its bend. The middle cell of the fore- as well as of the hindwing is rather narrow. The upper and middle discocellular is longer, weaker, and meets the third median vein at the bend. Two purely North American species belong to this genus.

N. menapia *Fldr.* (= tau *Scudder*, ninonia *B.*) (18 a) is white above and beneath, thinly scaled, *menapia*. therefore somewhat transparent, the forewing has black markings at the apex and the anterior part of the distal margin, with white subapical spots, the costal margin is broadly black to the apex of the cell, also the discocellulars. the rest of the costal margin narrowly black. Hindwing almost without markings. On the similarly marked under surface of the forewing the black markings are paler, the veins of the dirty-white hindwing are black, there is also a submarginal band of the same colour. The \mathcal{P} has on the upperside paler black markings, some submarginal markings, and sometimes on the underside small red spots at the distal margin of the hindwing. — Egg flask-shaped, fluted at the sides. Full-grown larva about 25 mm. (1 inch) long, head cylindrical, abdomen terminating in two short tails, dark green with a broad white band at each side and a narrow white band on the back, abdominal legs black, thoracic legs greenish yellow. Pupa dark green, striped with white, similar to the *Colias*-pupae, but somewhat more slender. Larva on various conifers, sometimes so abundant as to cause considerable damage. In the north-west of the United States.

N. terlooii Behr (= epyaxa Poling, Archonias lyceas Skinner) (18a) is very similar in pattern to tertooii. menapia, but the black markings are more extended; the σ^* has white, the $\hat{\gamma}$ red-brown ground-colour. The larva lives in a common web on Arbutus. California. — princetonia Poling, from Illinois, is probably princetonia. only a form of terlooii. In the σ^* both sides of the hindwing are sprinkled with pale red at the margin, the $\hat{\gamma}$ is deeper red beneath than above, and the veins are more broadly edged with black than in the $\hat{\gamma}$ of menapia. — From lack of material I have not been able to decide with cortainty whether this species belongs to this genus, but the agreement of the markings with menapia suggests a Neophasia.

2. Genus: **Eucheira** Westw.

Although this genus differs essentially from the preceding in the neuration, yet it is closely allied to it in the life-history of the larva. The larvae live gregariously in a web, go out at night in a procession to feed, and pupate in the web with the head downwards. The subcostal of the forewing is entirely free, hence the cell is closed by three discocellulars. The cell is very narrow and long. Only one species.

E. socialis Westw. (18a), from Mexico, is a smoky grey butterfly with a white central macular hand; socialis. \vee 4 the σ has in addition more distinct white submarginal spots on the upper and under surface of both wings.

3. Genus: Tatochila Btlr.

This genus is almost confined to the southern part of South America and is closely allied to the following genus, *Pieris*; it differs from this in the shorter middle discocellular and the almost straight lower discocellular of the forewing, but principally in the uniform character of the markings. The species of this genus appear to occur only in one generation. The butterflies fly from November to April.

T. volxemi Capr. (= achamantis Berg) (18a). Upper and under surface of the σ white with a volxemi. \mathcal{T} large black spot on the discocellulars of the forewing and slight blackish markings at the apex of the forewing above and beneath. σ similar to the \mathfrak{P} of *theodice Bl*, but the marginal markings somewhat narrower, the submarginal markings on the contrary somewhat broader, also a black stripe in the cell of the hindwing. — Argentina.

*) What the author calls the "third median" is really the third radial, there being three radial and two median branches in the butterfly-wing. — Transl.

autodice.

TATOCHILA. By J. Röber.

- **T. autodice** *Hbn.* (= demodice *Stgr.*) (18 b), from the most southerly part of Brazil (Rio Grande do Sul), Argentina, Uruguay, Chile and Bolivia (3-4000 m), is differentiated from the following species chiefly by the yellowish red border of the eyes; markings and colouring are stronger on the underside. The pupa, found by Dr. SETZ in Buenos Aires, is somewhat smaller than the pupa of *Pieris brassicae*, yellowish, with a number of minute dark spots, the spiracles appear as larger dark spots and there are similar dots also on the dorsum, the wing-cases are white, with a large dark spot at the discocellulars of the forewing, larger dark spots at the distal margin and numerous minute dark spots on the rest of the wings, the cases of the legs, palpi and eyes, at well as the thorax, are likewise dark (black-brown). The butterfly emerged on 22. February. The larva is apparently not yet known.
- mercedis. **T. mercedis** Eschsch. (= polydice Bl., autodice Kirby, autodice Elw.) (18b), from Chile, differs from autodice, in addition to the previously mentioned characteristics, in the purer white upper surface, the weakly marked under surface and the entire absence of the elliptical marking at the costal margin of the hindwing beneath. The X have a more or less developed streak-shaped black spot at the inner margin of the forewing above.
- T. theodice. T. theodice Bdv. (= blanchardii Btlr.) (18 c), from Patagonia, Peru and Chile, is cream-white above in the ♂, hight yellow in the ♀, particularly on the hindwing: it is the most distinct species in the genus. gymnodice. gymnodice Stgr., from Punta Arenas (Tierra del Fuego), is probably a local form. Ground-colour of the ♂ pure white, the black markings somewhat narrower, underside of the hindwing without saffron-yellow stripes, only the basal part of the costal margin sulphur-yellow and a similarly coloured stripe at the apex. The ♀ has likewise narrower, but sharper black markings, the arrow-like spots on both wings are sharper and are connected. Larva: head grey and covered with very fine, short hairs, body grey, with broad yellow subdorsal lines and a lateral row of small orange-red spots, and with raised black dots, sparsely scattered over the whole body, each with a very short, fine hair, ventral legs and underside of the body dark greenish yellow with small black spots, thoracic legs black. Food-plant: Tropeolum. Larva full-fed end of November (A. G. BUTLER). Flies from December to April.

10 argyrodice.

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T. argyrodice Stgr. (18 a) is only known in the female. This species is well characterised by the grey ground-colouring and the sharply defined tear-shaped yellow spots of the under surface. South coast of Tierra del Fuego (Uschuaia).

microdice. **T. microdice** Bl. (= xanthodice Mab.), from Chile and Patagonia, is smaller and with less markmacrodice. ings, also beneath a paler colour than macrodice Stgr. (18 c, d), from Bolivia. — sterodice Stgr., from the sterodice. east coast of Tierra del Fuego, is differentiated from this latter by a complete absence of yellow markings on the under surface, it is also white, almost without markings on the upper surface of the σ , which is strongly glossy in the basal half. The \mathfrak{P} has not a trace of yellow on the upper surface, whilst the markings arctodice. are similar to those of the \mathfrak{P} of microdice. — arctodice Stgr. occurs in Colombia and Ecuador. This form is very strongly marked with black, especially in the female; the upper surface of the \mathfrak{P} is principally brown-black (with yellow spots).

T. pyrrhomma spec. nor. (18 d), from Peru (Huancabamba, 3000 m), may be regarded as a distinct species on account of several important differences. The eyes are broadly (more broadly than in *autodice*) edged with fiery red-yellow, the black stripe at the costal margin of the forewing above extends to the base, the black spot on the discocellulars is distinctly smaller, the black marginal and submarginal markings are less developed, the latter almost square, the upper surface of the hindwing entirely without markings and strongly yellowish on account of the yellow colour of the under surface shining through. On the underside the veins are more broadly white, their margins more broadly grey-black than in *microdice*, the lower discocellular of the hindwing without white spot, the grey-black stripe in the cell very narrow and forked distally, besides the very sharply defined and broader saffron-yellow stripe at the costal margin is white, the veins are very finely black, those in the apex sharply white and very narrowly edged with black, the black spot at the end of the cell is small, the sulphur-yellow colouring of the apex reaches to the second median, and submarginal markings are completely wanting on both wings. σ^{i} unknown.

xanthodice.

T. xanthodice Luc. (18 d), from Venezuela, Colombia, Ecuador, Peru, Bolivia and Argentina, differs from *microdice* and *argyrodice* on the under surface chiefly in the saffron-yellow stripes betwen the veins of the hindwing. from *microdice* also in the absence of the white spot on the discocellulars on the underside of the hindwing. On the under surface the apex of the forewing has saffron-yellow stripes and the anterior veins are sharply edged with black to the apex of the cell.

demodice. **T. demodice** Bl., from Chile, South Patagonia and Tierra del Fuego, is distinguished from the following form by the absence of the arrow-spots on both wings. It must be noticed that according to

Publ. 15. XII. 09.

PIERIS. By J. Röber.

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BLANCHARD's insufficient description the name *demodice* cannot be employed with certainty for this species. I have seen no specimens which agree with this description, which may be translated thus: "Wings of the σ^2 above white, of the γ yellow-blackish, in both sexes marginal spots, a row of arrow-spots and a black discoidal half-band: beneath the forewing yellowish at the apex, the hindwing entirely yellow, veins margined with black, gold-yellow lines -20-21 lines." — sagittata form. nor., spec. nor.? (18e), from Peru (Huanca-sagittata. -18 bamba, 3000 m.), differs from this supposed demodice by the markings of the hindwing (shown in the figure), and further by the presence of four black submarginal arrow-spots on the forewing beneath, as well as by the colouring and pattern of the underside of the hindwing. The latter has a light yellow ground-colour, the veins themselves are very narrowly light, but edged with blackish about as broadly as in orthodice, there is a similar stripe in the cell, which shows no small white spot on the discocellular, between all the veins are satfron-yellow stripes and at the distal margin four very pointed blackish arrow-spots; at the distal margin there is an almost uninterrupted fine black marginal line, such as occurs in no other species of this genus. Underside of the forewing white, the veins becoming more broadly black towards the margin, the discocellulars not broadly margined with black, four submarginal arrow-spots, apex of both wings light yellow. 9 unknown.

(1949)

T. stigmadice Stgr., from Bolivia (Cocapata, 3500 m.), differs from *immaculuta* here figured by the stigmadice. ***9** much broader black spot on the discocellular and by the presence of 4-5 triangular black submarginal spots on the forewing and 2-5 of such spots on the hindwing, as well as the saffron-yellow colouring of the hindwing. — In **immaculata** form. nor. (18 e), from the province of Tucuman in Argentina, the sub-*immaculata*. For marginal markings are completely absent above and beneath; the under surface of the forewing is white with small yellow stripes in the apex, the veins are narrowly black, the black line on the discocellular is not widened: the hindwing is yellowish white, with bright yellow, sharply defined narrow stripes between all the veins and at the costal margin, the veins themselves are very finely light, being narrowly edged with grey-black, a similar stripe, indistinctly forked at the discal end, is placed in the cell, the discocellular is light like the ground-colour. \$ yellowish, veins rather broadly dark, with submarginal arrow-spots on the forewing and more distinct ones on the hindwing.

T. orthodice Weym. (18e), from the high mountains of Bolivia, has a white upper surface with the orthodice. The markings as shown in the figure. Under surface of the forewing white with yellowish apex, in which the white veins are dark-edged. Under surface of the hindwing sulphur-yellow, the veins broadly white, dark-edged, saffron-yellow stripes at the costal and hindmargins, as well as in the cell, which has likewise a black-ish stripe. \Im unknown.

4. Genus: Pieris Schrk.

This genus, distributed over the whole world, is considered as the typical representative of the family. The subcostal of the forewing is four-branched with 2 branches before the apex of the cell, the third branch is very short and runs into the costal margin shortly before the apex, the cell is large, not over broad, and is closed by 2 discocellulars; the upper discocellular is wanting because the upper radial is coincident with the subcostal for some distance. The precostal of the hindwing branches off from the costal almost at right angles and its pointed apex is curved distad. The costal margin of the forewing is smooth, the antennae have in general a distinct club and are mostly of medium length, very long in some species, the palpi mostly project beyond the head and are densely covered with stiff hairs in front, the end segment is as long as or longer than the middle segment, slender and pointed, wery short hairs, and has light longitudinal stripes. Pupa moderately slender, with obtuse tip to the head and several small protuberances on the dorsum, sometimes with the wing-cases somewhat more produced. The species which belong here have probably all of them at least two broods, one of which in the temperate zones hibernates in the pupa.

P. monuste L. (= hippomonuste IIbn., feronia Stph., phileta F., albusta Sepp) occurs in several monuste. forms from the south of North America (the Gulf states) to Argentina, also in the mountains of the west. The form from Surinam may be regarded as the nymotype of the species. — orsels Godt. (18e, f), from orsels. • the southern states of Brazil, has the margin more broadly black with white apical spots, the φ mostly with yellowish ground-colour, especially on the hindwing, on the latter also rather large pointed black marginal spots. cleomes Bdr, from the south of North America, is somewhat smaller and less blackly marked. — cleomes. virginia Godt. (= φ eubotea Godt.?) is the form from the Antilles. — Of evonina Bdr, from Cuba, 3 forms virginia. are described: evonina with greenish white colouring of the σ^2 , marginal marking narrow, reddish, brown; evonina underside at the apex of the forewing pale and dirty ochre-yellow, hindwing of the same colour, without spots: valei Edr., upper surface white, marginal pattern narrow, black and dentate; under surface of the valei. \checkmark forewing brownish, of the hindwing whitish, faintly ochre-yellow; joppe Bdr, smaller than monuste, above joppe. dull white, marginal pattern dark brown, a black spot at the apex of the cell. — automate Burm., from automate. Argentina. has only small blackish markings at the apex and the distal margin of the forewing. — suasa suasa.

PIERIS. By J. Röber.

Bdr., from Chile, Peru and Bolivia, has somewhat more black markings than *autodice*. Larva violet, with citron-vellow longitudinal bands, head, legs and underside greenish yellow. Pupa pale yellowish, with blackish dots, a small hump on the middle of the dorsum. Lives on Cleome pentaphylla and other allied plants and causes the same damage to agriculture and horticulture as brassicae and rupae in the Palaearctic Region.

P. sevata Fldr. (18 f), from Colombia, Venezuela and Central America, is similar to monuste, but is sevata. distinguished from it by a broad layer of scent-scales along almost all the longitudinal veins of the forewing and also two veins of the hindwing. The under surface of the σ is yellowish white, the apex of the forewing somewhat darker yellow, the costal margin of the hindwing narrowly edged with ochre-yellow. - In tiburtia. tiburtia Fruhst., from Guatemala, the black apical spot has almost entirely disappeared and the black median spot is reduced, apex of the forewing beneath yellowish white, hindwing beneath with more vivid gloss, timotina. rose-coloured instead of yellowish, veins not suffused with black. - timotina Fruhst., from Peru, is larger, with broader and more extended black margin, which is deeply dentate, a large black median spot, under amphissa. surface darker, median spot sharper and the veins more distinctly streaked with brown. - amphissa Fruhst., from Bolivia, is smaller than tiburtia, upperside yellowish white, entirely without markings, only the costal margin of the forewing lightly suffused with brown, without median spot, underside of the forewing white with yellowish apex and brown median spot, hindwing uniform pale yellowish white with orange-coloured basal spot.

sincera. P. sincera Weym. (18f), from Ecuador (Guayaquil), is greenish white above with black apical and distal-marginal area on the forewing as well as very small black marginal markings on the hindwing. The underside is lighter and without markings except a yellow stripe at the costal margin of the hindwing.

P. buniae Hbn. (= enders Godt.) (19a) is the giant of the American species of Pieris. From this buniae. ausia. form, which occurs in the central provinces of Brazil, ausia Bdr., from the southern provinces, is distinguished by a somewhat more extensive development of the black markings, which in both sexes sometimes occur rusella. also in the middle and at the distal margin of the hindwing beneath; to ab. rusella Fruhst. belong 🛱 in If digentia, which the black band of the forewing is wanting (Bahia, Espiritu Santo). 2-ab. digentia Fruhst., from Bahia, sabella is remarkable for the specially broad black band of the forewing. — sabella Fruhst. (= ausia Stgr.), from pharetia. the Upper Amazon, has no markings at all on the under surface of the hindwing. - pharetia Fruhst., from Peru, is larger, the apical spot of the forewing beneath is effaced, the underside of the hindwing only with imperator. traces of a brown transverse band or without even these. — imperator Kirby, from the Upper Amazon, is the most darkly marked form; in it the \mathfrak{P} has also on the upperside of the hindwing abundant black markings and on the upperside of the forewing a curved black band occupying half the costal margin and the disphaloë. cocellular. - phaloë Godt., from the Upper Amazon, is smaller and with less markings than imperator. diana. diana Fldr., from Colombia, has the black apical and marginal markings diffuse. - sublineata Schaus (19a), 44 45 sublineata. from Peru, is distinguished chiefly by the strongly yellow colouring of the hindwing beneath. - All the forms of buniae have an even broader layer of scent-scales at the veins than seruta.

4 amaryllis. P. amaryllis F. (19a), from Jamaica, differs from josepha by the ,café-au-lait colouring. - josepha josepha. Godm. and Salr. (19a). from Mexico and Central America; also discovered by Herr L. HARTMANN of Würzburg in Texas, is undoubtedly nearly allied to the preceding species, but must certainly be regarded as a separate species on account of the peculiar form of the σ and the style of marking of the \mathfrak{P} . On the under surface besides the black median spot of the forewing there are only quite small dark markings present in 4 gervasia. the middle of the wings. ab. gervasia Fruhst. is a female form which has a white under surface with grey-4 josephina. yellow scales. - josephina Godt, is the form from San Domingo. - protasia Fruhst., from Honduras and 🗊 protasia. Nicaragua, has a much smaller black median spot. — krugii Dev., from Porto Rico, is smaller, the distal 51 krugü. margin of the forewing more incurved, the black spots almost completely effaced.

52 P. menacte Bdr. (19b), from southern Brazil and Paraguay, is white above with dark scaling (somemenacte. times wanting) at the apex of the forewing. The 2 has much darker markings. The under surface is yellowish white with more or less blackish scaling (sometimes absent) along the veins of the hindwing.

cruciferarum. P. cruciferarum Bdr. (= casta Ky., marginalis Soudd.) (18 f), from California, is plain yellowish white above, beneath more strongly yellow, with ochre-yellow stripe and narrow black edging to the veins of the hindwing.

54 rapae. P. rapae L. (19b) was introduced into Canada about 1860 and has since spread as far as Hudson's 55 novangliae. Bay and South Texas. The larvae cause great damage every year. ab, novangliae Scudd. is a sulphur-yellow form. - Larva light green, velvety, with a fine yellow longitudinal line on the back, paler laterally with a narrow yellow stripe in which the black spiracles are placed, venter yellow-green, head brownish yellow, 20-30 mm. long, Lives on cabbages, Reseda, cress, etc. Egg pear-shaped with longitudinal ridges and transverse folds, laid singly. Pupa yellow, greenish grey or brownish with 3 yellow stripes.

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43

PIERIS. By J. Röber.

P. napi L. although distributed over the whole of North America, is much rarer there than in the napi. 55 Palaearctic Region. The summer form *napi* differs from the spring form **oleracea** Harris by more abundant oleracea. dark markings, especially on the under surface, whilst in the Palaearctic Region on the contrary the spring form has more markings; ab. virginiensis Edu. (19b) is distinguished from oleracea in that the forewing has virginiensis. 57 an indistinct dark apical spot on the upper surface and on the under surface of the hindwing there is very tine but broad dark scaling along the veins, but specimens also occur in which the whole of the hindwing beneath is darkened except for the fine white veins; such specimens have also broad grey streaks at the veins at the apex of the forewing beneath; ab. pallida Scudd. is purer white above and beneath, only the pattida. 59 2 has a small black spot on the upperside of the forewing. — The alpine and northern form bryoniae Ochs., bryoniae. 60 which occurs in Alaska as well as in some parts of the Palaearctic Region, has in the \mathcal{P} yellowish groundcolour on the upper surface and rather broad dark margins to the veins. This form is considerably lighter than the Palaearctic form of the same name. -- acadia Educ, is a large form, which comes between pallida acadia. and bryoniae in colouring and pattern. — frigida Scudd., from Labrador, is a whiter form and hulda Edw. frigida. (19b), from Alaska, is similar to frigida, but much smaller. — castoria Reak. (= resedae Bdr.), from Cali-hulda. 67 fornia, is a form without much marking. — Larva brownish green, lighter at the sides, with small white castoria. 64 tubercles, black dots and a yellow lateral stripe, above which the black, red-yellow edged spiracles are placed, head grey-green: 29-30 mm. long. on the same plants as rapae. Pupa greenish yellow, with black spots and dots and yellowish margin to the wing-cases. Egg pear-shaped, likewise laid singly.

P. protodice Bdr. (19 c), distributed from Canada to Guatemala, has white ground-colour, a large protodice. median spot divided with white and in the or slighter, in the 9 stronger pattern of marginal and submarginal spots on the forewing. The upper surface of the hindwing in the σ is almost without markings, in the $\hat{\varphi}$ with submarginal dentate markings as well as black marginal spots. The under surface has much paler markings in hoth sexes. — In the winter form. vernalis Edw, the $\vec{\sigma}$ is smaller and less marked than the $\vec{\sigma}$ of proto-vernalis. $\vec{\delta}$ dice, the φ on the contrary scarcely different from that of *protodice*. — Larva in the earlier stages unicolorous orange-yellow, head black, in the later stages the head light straw-colour, posterior half light purple, a goldvellow spot on each side, the whole head sprinkled with black-brown, eyes purple, broadly edged with black. Body alternately glossy gold-yellow and dark greenish purple, sometimes with unitorm, in other cases with unequally broad black band. The yellow colouring of the sides of the back and of the stigmatal band runs into the purple of the intrastigmatal band. Beneath dull light green with reddish tinge. On the whole body larger and smaller black spots, each of which bears a short black hair, also numerous small hairy tubercles (from specimens preserved in glycerine). Pupa light bluish green, slightly suffused with yellowish on the abdominal segments, a dull, broad yellowish lateral stripe on the abdomen, suprastigmatal ridges margined with yellow. Head with small, dispersed blackish spots, wing-cases with faint dark brown marks, veins marked with small, separated, distinct black spots, a black spot on the basal protuberance, segments of the antennae mostly marked in the same way. The spiracles are the same colour as the body. Larva on Brassica oleracea, Lepidium virginicum and other Crucifers.

P. occidentalis *Reak*: (19c), from the mountainous regions of the west of the United States, has the *occidentalis*. f' dark markings more extended and less interrupted than *protodice* and the under surface, especially of the hindwing, is strongly marked with green. — *occidentalis* is regarded by SCUDDER as the third generation of *protedice* (only occuring in the west?). Thus it would seem that the carly stages do not differ from those of *protodice*.

P. sisymbril Bdc. (19c), from the United States, is smaller than occidentalis, the black marginal mark-sisymbril. GP ings are more sharply defined and divided by the veins, which are light here, but sharply dark in the rest of the wings. The underside of the hindwing has black-green markings, broken up in a peculiar manner. The 2 is quite similar to the σ . — Egg long, narrow, conical, ground-surface and vertex flattened and depressed, with longitudinal ridges, the interspaces hollowed out and crossed by numerous stripes; colouring at first light yellow, shortly before emergence red. Full-grown larva about 22 mm. long, cylindrical, moderately narrowed anteriorly and posteriorly, light yellow, with black stripes crosswise, each segment sometimes with a fold and in this case on the back small yellow protuberances of irregular size, each terminating in a small fine hair: on all the segments behind the 2. and inclusive of the 12. are 2 stripes. The larva varies very much. Time of development from the egg to the pupa in April - May 33 days, in May - June 30 days. Pupa cylindrical, narrow at the head, hollowed out at the sides, a short thick projection between the eves, mesothorax projecting, rounded, slightly keeled in consequence of a depression as deep as the mesothorax is high, which however is not uniformly rounded but rather angular, on each side of the dorsum and the anterior abdominal segments are small, angular, inconspicuous elevations, the anterior ones the most distinct: colouring dark brown, the whole upperside except the wing-cases irregularly covered with small protuberances (the pupa is figured by EDWARDS, Butterflies of North America, hanging free).

P. beckeri Edw. (19c), from the United States, is similar to the Euchlo"-species. Upper and under beckeri. 69 surface white, on the upperside of the forewing a large black median spot, divided with white, and smaller

PIERIS. By J. RÖBER.

and indistinct marginal and submarginal spots. Under surface with a large black median spot and two black submarginal spots, as well as greenish markings at the apex of the forewing and at the distal margin, in the middle and at the base of the hindwing, veins for the most part yellow. - Full-grown larva about 33 mm., colouring greenish white, strongly mottled or sprinkled with grey, and with a very distinct orangecoloured belt between the segments, each segment with 16-18 pitch-black tubercles, terminating in black bristles, head yellow. Pupa in general like that of protodice, but less angular; the frons ends in an obtuse projection, the head part is rounded, with uneven upper surface, the dorsal side of the thorax is dark greybrown, the elevation above the wing-cases, which protodice possesses, is wanting in beckeri, the rest is grey, on the wing-cases and the back of the first two abdominal segments almost white; a light stigmatal stripe runs from the margin of the wings to the anal extremity, between thorax and abdomeu are 4 small spots dorsally. Duration of the pupal stage 15 days. Lives on Crucifers. The first generation flies in April, the second from the end of June for 3-4 weeks. No differences have been found between the butterflies of the two broods.

venosa.

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P. venosa Scudd. (19c). from California, is white on the upper surface with the veins scaled with black in the anterior part of the forewing and black dots at the ends of the veins on the hindwing, as well as a black spot on the forewing between the 2. and 3. median veins, on the yellowish white under surface all the veins are rather broadly and very darkly margined, but the veins themselves light.

itaticayae.

P. itaticayae Foett. (19d), from Brazil, is white on the upperside with yellow stripes between the veins and black apical area on the forewing and small black marginal marking on the hindwing. The under surface of the forewing is white, vellow at the costal and distal margins, the hindwing is darker vellow and the veins with dark margins.

P. aripa Bdc. (19d), from Venezuela, has yellowish white upper surface, with black apical and aripa. distal-marginal marking, the under surface is somewhat lighter with a black median spot on the hindwing. balidia. at the apex of the forewing the black marking of the upper surface shows through. - balidia Bde., from elodia. Mexico, is generally more yellow, especially on the underside of the hindwing. - elodia Edr., from Mexico, is not essentielly different. It would be most correct to unite all the three forms. P. aripa occurs from Mexico to South Brazil, is nowhere rare and varies somewhat. The \$\varphi\$ have more vellowish ground-colour; probably etodina, balidia, which I only know from the figure, is an aripa- Q. - elodina Star. i. l., from Bolivia, is larger and on the under surface almost pure white.

P. eleusis Luc. (19d), from Colombia and Venezuela, differs from elodia by its much more pointed eleusis. forewing, broader apical and distal-marginal marking, and also by the black marking in the cell of the forewing above. The 2 has a yellowish upper surface to the hindwing and broader black marking in the cell helena. of the hindwing. — helena Luc., from Ecuador, has a narrower black margin, less black dusting at the costal margin and lighter, almost white, under surface.

pylotis. P. pylotis Godt. (19 d), from Brazil, is white above with broad black apical and distal-marginal marking, and also a black median spot on the forewing. the hindwing has black spots at the distal margin, but is, however, not infrequently entirely white. The under surface is similar to the upper, but the distal margin of the forewing is light grey, the hindwing has a black spot at the discocellular and an ochre-yellow one at the base. The 2 only differs by a yellowish tone on the hindwing beneath.

olympia. P. olympia Fldr. (19e), from Venezuela, Colombia and Peru, has white ground-colour with black distal-marginal area and a small black median spot on the forewing, the under surface is silver-white with black submarginal markings on the forewing and fine black veins on the hindwing.

P. tovaria Fldr. (19e), from Colombia and Venezuela, differs from olympia in the more normal /tovaria. distal-marginal area and the absence of the black median spot of the forewing. The 2 has broader, but paler sub- marginal markings and the hindwing is yellowish beneath. - subflavescens Kirby, from Ecuador, has the flavescens. hindwing yellowish beneath and the apex of the forewing sulphur-yellow. - maruga Fruchst., from Ecuador, maruga. is larger than toraria, with much broader black margins, the underside of the forewing darker in the cell 🐒 gina. and the stripes between the veins are sharper. — gina Frukst., from Peru, is larger than maruga, forewing more pointed, the black distal margin essentially broader, more deeply indented proximally, the base of the wing with less black scales, beneath the black band on the forewing broader.

philoma. P. philoma Hew. (19e). from the high mountain ranges of Ecuador and Peru, is white above with very broad black margins and a white subapical spot on the forewing. The under surface of the hindwing and the apex of the forewing are silver-white with sharp, thin black veins and stripes between the veins, the forewing has also the corresponding submarginal marking on the upper surface.

euthemia. P. euthemia Fldr. (19 e), from Colombia and Venezuela, is distinguished from philoma by much narrower black markings: the hindwing is white except for a narrow black margin.

penthica. P. penthica Koll. (19e), from Colombia, is also similar to philoma, somewhat larger, with less black markings, the hindwing is blue in the posterior half, the under surface of the hindwing, in addition to the

PIERIS. By J. Röber.

61

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very fine, much less conspicuous black veins, has only traces of the black stripes between the veins at the distal margin, on the other hand a rather large black spot on the discocellular. — stamnata Luc., from Venezuela, stamnata. $\mathcal{S}^{\#}$ is somewhat smaller, but otherwise differs little from *peuthica*. — messala Fruhs., from Peru, has the fore-messala. $\mathcal{S}^{\#}$ wing more pointed, beneath the cell of the forewing is more broadly scaled with black and the subapical black transverse band is somewhat narrower. — basiliola Fruhst., from Bolivia, is smaller and lighter, the *basiliola*. $\mathcal{S}^{\#}$ white subapical spot of the forewing broader, the black distal margin of the hindwing decidedly narrower and the anal area of the hindwing above almost without blue-grey scaling.

P. subargentea Blr. (19e), from Peru, has the upper surface almost black, with white-yellowish *subargentea*. **9** markings. The under surface of the forewing is similar to the upper, only the apex is bluish instead of black. The underside of the hindwing is bluish with silvery sheen, the middle of the wing whitish, at the costal margin a yellow stripe and the veins and the stripes between them are narrowly black. — lia *Fruhst.*, from *tia.* **9** Bolivia. is larger and is less extended black.

P. caesia Luc., from Ecuador, is distinguished from tenuicornis Btlr. and Druce (19t), from Central caesia. America, by narrower black distal margins and the almost complete absence of the sulphur-yellow scaling tenuicornis. at the apex of the forewing beneath. The \mathfrak{P} is black-brown except for the white median and apical markings of the forewing and the yellowish middle of the hindwing, and has also a broad grey-brown submarginal band on the underside of the hindwing. — semicaesia Fldr, from Colombia, is a small form with parrower, semicaesia. pale black-brown margins and impure blue on the under surface. — phanokia Fruhst. (= semicaesia Fldr?), phanokia. from Colombia, of which only \mathfrak{P} are known, is larger than caesia and has on both wings a much broader margin above and beneath.

P. cinerea Hew. (t9 f), from Ecuador, has the upperside of the forewing white with the apical half cinerea. black, in which a white apical spot is placed, the hindwing in the σ is blue and in the 2 black with yellowwhite costal margin. The under surface is quite similar except that there are small sulphur-yellow spots at the apex of both wings, a stripe of the same colour at the costal margin and small ochre-yellow spots at the base of the hindwing. The 2 is paler coloured, the spots at the apices of the wings and stripe at the costal margin of the hindwing on the underside are white instead of yellow. — litana Fruhst., from Bolivia, litana is smaller, the black distal margin narrower, the under surface of the forewing purer white, that of the hindwing paler yellow. — menthe Hopff. is the slightly different form from Peru.

P. mandela Fldr, (20 a) is the oldest name for a species particularly rich in female forms. P. man-mandela. dela is the form from Venezuela with moderately broad black apical marking, in which are one larger and several very small white subapical spots, and with very narrow black distal margin to the hindwing. The under surface of the hindwing is lighter than in the better known locusta from Colombia. 9 more like the σ than the \mathfrak{P} of the other forms, distinguished from the σ by the broader black margin and the yellowish tint of the rest of the hindwing. - apicalis Bilr., from the Upper Amazon, Peru, Colombia and Ecuador, apicalis. is larger in both sexes, in the o' the black apical margin more sharply angled proximally, the distal margin distinctly narrower posteriorly, the upper white subapical spot larger, the distal margin of the hindwing broader in the posterior half, the under surface lighter; the φ is similar to the mandeda- φ , the proximal part of the hindwing grey-brown to the end of the cell, the under surface of the forewing not sulphur-yellow at the base, the hindwing has more red colouring, the brown parts are more coffee-brown and the submarginal spots larger. — noctipennis Bilr. and Druce (20a), from Costa Rica and Chiriqui, has in the d a somewhat noctipennis. broader black distal margin to both wings than mandela. The under surface of the hindwing is somewhat darker and the yellow marginal spots are sharper and deeper yellow. The 2 has the upper surface of the forewing more yellowish with black apical third in which a yellowish subapical spot is placed, the base is yellowish grey-brown, the hindwing is black-brown with two small yellow subapical spots. - locusta Fldr. locusta. (20 a). from Colombia is scarcely different from *noctipennis* in the σ , the \mathfrak{P} on the other hand has the distal third of the forewing and the whole of the hindwing a deep purple-brown colour; a small white subapical spot on the forewing is sometimes present. The white colour of the middle part of the forewing is tinged with red. The under surface of the hindwing is darker and the yellow submarginal spots are more indistinct. - rubecula Fruhst. (20 b), from Peru. has in the or three distinct subapical white spots, the black apical rubecula. and distal-marginal marking only reaches to the first median vein, the hindwing is more broadly margined with black and the under surface of the hindwing is very light, with much yellow marking and vermilion streaks at the base. The \mathcal{P} has a black central longitudinal band from the cell to the distal margin of the forewing. - xanthomelas subsp. noc., from Ecuador (Coca), is in the female similar to rubeculu, the hindwing xanthometas. has strongly yellowish ground-colour, which is also present on the basal part of the forewing, also the hindwing is much darker, the black central longitudinal band of the forewing is shorter and narrower, the under surface of the hindwing is much darker and the vermilion and vellow streaks are longer and stronger. pallida subsp. nor., from Bolivia (Yungas de la Paz, 1000 m.), has a smaller black apical part to the forewing patida. 103 above, with its proximal edge rather straight, and broad, diffuse black distal margin to the hindwing. The under surface, particularly on the hindwing, is very light and only diffusely marked. - tithoreides Bilr. lithoreides. 766 (20 b), from Ecuador (Balzabamba), has in the of a broad black distal margin to both wings, the hindwing

LEPTOPHOBIA. By J. Röber.

has a row of small white submarginal spots, under surface dark, yellow markings darkened, the red basal markings and yellow spots reduced. Q with yellow longitudinal central band on fore- and hindwing, a white cocana. transverse median band and white submarginal spots on both wings. - cocana Fruhst., from Ecuador, is only distinguished from *rubecula* on the upperside by the narrower black distal margin of the hindwing. The under surface of the hindwing has white instead of reddish ground-colour, sharp dark marking and the yellow permagna. and red markings very much reduced. ² unknown. - permagna Fruhst., from Peru (Chanchamayo), is similar to cocuna, the red basal spots on the underside of the hindwing are enlarged and the subinarginal motione. spots larger and whitish yellow. - molione Fruhst., from Paraguay, is the most southern subspecies and has the least markings of any; it is smaller than *rubecula* and has a much narrower, lighter grey-black distal margin to the hindwing, which is proximally broken up into fine blue-grey scaling; the light grey under surface of the hindwing recalls *viardi* in the fine yellow stripes between the nervures,

viardi. **P.** viardi Bdr. (= habra Doubl.) (20 b), from Honduras, is white above in the \vec{c} , with black, whitespotted apical and distal-marginal markings and a large black median spot on the forewing, which however is sometimes wanting, and entirely white hindwing. Underside of the hindwing similar to mandela, but much lighter and the light yellow submarginal spots diverging from the margin from the middle of the distal margin towards the inner margin, markings of the forewing beneath as above, only much paler, 2 above and on the under surface of the forewing black-brown with vivid yellow bands and spots, under surface of *taogore.* the hindwing as in the σ^2 , only darker, — **laogore** Godm., from Mexico and Guatemala, has lighter markings on the underside of the hindwing and has no sulphur-yellow markings there.

5, Genus: Leptophobia Bthr.

This genus cannot be maintained in the wide limits laid down by the author, but may be defined according to the characters observed in the genotype eleone D.-H., with which only a few of the 15 species included by Butler are congeneric. The principal characters of this genus consist in the formation of the precostal, which is curved proximally, and in the shortness of the middle discocellular, which is scarcely 1/4 as long as the weakly curved and less obliquely placed lower discocellular. The subcostal is four-branched with two branches before the apex of the cell, the upper radial is stalked with the subcostal almost to the half. The long antenna (reaching to $^{2}/_{3}$ of the margin of the forewing) is not characteristic for the Leptophobia-species, but occurs also in some species of Pieris.

L. eleone D.-H. (= suadella Fldr.) (20 c), from Colombia and Venezuela, has the forewing pointed eleone. and the hindwing produced at the anal angle. The *¬* is lemon-coloured above with broad black distal margin and narrowly black hindmargin on the forewing, somewhat more than the anterior half of the cell being also black. The \mathfrak{P} is light yellow on the hindwing, almost white on the forewing, but marked like the σ , ochracea, though \$\$ also occur with light ochre-yellow forewing and lemon-yellow hindwing: ab, ochracea form. nov. The under surface of the hindwing and the apex of the forewing are vellowish white, with a pearly gloss, the rest of the forewing light yellow, the hindwing has two small black spots on the discocellular and small 114 doubledayi, black marginal spots. — In doubledayi Stor. i. l., from Bolivia, the tooth in the black distal margin is shorter 115 luca and the under surface of the forewing deeper yellow. - luca Fruhst., from Bolivia and Ecuador, has a 116 conica. narrower black distal margin and no black border at the inner margin. - conica Fruhst., from Colombia, euremoides. is an aberration of eleone, in which the tooth in the black distal margin is prolonged. - euremoides is the name given by FRUHSTORFER to that form which is only margined with black towards the apex and in which the cell is lightly scaled with black only at the costal margin. — The butterflies fly over fields and in thickets and are fond of being driven by the wind.

smithi. L. smithi Kirby (20 c), from Bolivia and Peru (3000 m.), has the wing-shape as in elcoue, is lemonyellow above in the c^3 , light orange-yellow in the \mathfrak{L} , the distal-marginal markings are much narrower and the cell is not coloured with black. The under surface is more greenish than in *eleone* and the black marginal spots are wanting.

114 eucosma. L. eucosma Ersch. (20c), from Peru, is larger than smithi, has the same yellow upper surface with black apical marking on the forewing, the underside is much lighter and has small black dots on the veins at the distal margin of the hindwing. - This species is only known to me from the figure, consequently I cannot state positively whether it belongs in this genus.

L. pinara Fldr. (20 c), from Colombia (and Peru?) (3000 m.), has the peculiar form apparent in the 126 pinara. figure. Upper surface white with black apical and distal-marginal markings, black median spot on the forewing and slight traces of black colouring at the anal angle of the hindwing. Under surface white, on the discocellular of each wing a black spot, as well as small black marginal spots on the hindwing, the latter 121 oiantheia. and the apex of the forewing glossy. — oiantheia Fruhst., from Peru, is smaller and has a narrower black distal margin on both wings, smaller median spot on the forewing and pure white apex to the forewing beneath.

ITABALLIA. By J. Röber.

63

L. nephthis Hopf/. (20 c), from the mountains of Peru (3000 m.) and Bolivia, does not differ mater-*nephthis.* 732 ially in shape from the *Pieris*-species. The upper surface is white, the forewing has rather broad black marking at the apex and the distal margin, the anterior half of the cell being also black, and the hindwing has a narrow black margin. The under surface is white, on the hindwing somewhat glossy, the forewing has the marking as above, but somewhat reduced, the apex is light, the hindwing has a small black median spot as well as a few very small black marginal spots at the posterior part of the distal margin. — aymara aymara. *Feulst.* is an aberration with quite narrow black distal margin on the hindwing and interrupted subapical band on the forewing.

L. erinna Hopff. (20d). from Peru, is likewise only known to me from the figure, hence I am not erinna. **124** certain ot its generic position. The upper surface is slightly yellowish white with rather broad black markings at the apex and the distal margin and large black median spots on the forewing, the hindwing with only very small black marginal markings. Underside similar, only with bluish instead of black apical and marginal markings on the forewing; hindwing with small black dots at the distal margin. The \mathfrak{P} is yellower above and beneath and has paler and somewhat more copious black markings at the distal margin of the forewing.

L. cinnia *Fruhst.* (20 d), from Ecuador, has white upper surface with rather broad black markings *cinnia.* **725** at the apex and the distal margin, a black median spot and black costal margin on the forewing and also an interrupted black marginal line on the hindwing. The under surface is white with a black median spot on the forewing and strongly silvery gloss on the whole of the hindwing and at the apex of the forewing. ² unknown. — falledra *Fruhst.*, from Colombia, has a broader black costal margin on the forewing, espe-*falledra.* **726** cially in the distal part of the cell. and a broader black distal margin.

6. Genus: Itaballia Kaye.

The character of this genus consists in the formation of the precostal, which is not placed at right angles to the costal as in *Pieris*, but is strongly curved and in its distal part runs almost parallel to the costal: otherwise it has no structural differences from *Pieris*. From *Perrhybris*, with which it was united until recently, it is distinguished by the four-branched subcostal.

I. demophile L. (= molphea Cr.) (20 e), occurring from Colombia to Paraguay, is white above in demophile, the c., with black apex and black subapical half band, hindwing very narrowly margined with black, under surface of the forewing white, marked as above, but the subapical band reaching to the costal margin, hindwing vellowish with very broad black-brown margin. 2 above and beneath vellowish, the subapical band broader and reaching the costal margin above also, costal and distal margins of the hindwing broadly greyblack. - calydonia Bdr., from Central America and Venezuela, is somewhat smaller, less marked with black calydonia. and the under surface of the hindwing without any dark markings. - amathonte Cr. is a very dark (per- amathonte. 12) haps rainy seasonal) form of the 9. - charopus Fruhst., from Rio Waupes, is distinguished by a narrow black charopus. costal margin of the forewing and the lesser development of the subapical spots, distal margin of the hindwing with moderately broad black scaling, veins suffused with black, beneath the subapical band of the forewing and the distal margin of the hindwing narrower. - niphates Frukst. has the black spots much niphates. 137 narrowed, hindwing with quite narrow antemarginal line, under surface of the forewing also less marked with black, hindwing diffusely margined with brown-black. Para. — **nimietes** Frukst, from Bahia, is distinguished *nimietes*. **132** trom *demophile* by narrower and more sharply defined yellowish transverse bands on the forewing, under surface with longer subapical band. - huebneri Fruhst., from Rio de Janeiro, is similar to amathonte. - incomeri. 133 niseias Fruhst., from Paraguay, is similar to calydonia: small, distal margin of the upper surface broader, uiscias. 134 markings otherwise as in charopus, under surface similar to niphates, but the black distal margin extending to the anal angle, hindwing with a rather broad, complete band of uniform width, which is sharply defined proximally. - minthe Fruchst., from Ecuador, is essentially smaller than charopus, the wings are more minthe. 199 roundish, the upper surface of the forewing with extended black apical spot, the hindwing however more narrowly margined with black and in the anal angle with a narrow, densely scaled area, under surface of the hindwing pure white, the black distal margin narrower; ² above with very broad white areas, the base of the cell yellowish with grey scaling, hindwing mostly white, the black distal margin deeply indented. --lucania Frukst., from Peru. is approximately as large as niscias, apical spots of the forewing narrower than Incania. in minthe, black scaling on the hindwing less extended; 2 with light ochre-yellow ground-colour, black distal margin of the hindwing less indented, very broad at the anal end, beneath the distal margin of both wings brown, the ground-colour suffused with ochre-yellow. - mustica Frukst., from Bolivia, is very similar to mustica. 18/2 huebneri, but the white central area of the hindwing more extended beneath; ? differing from hucania in the pale and diffuse vellowish ground-colour, under surface of the forewing whitish, vellowish towards the margin, cell suffused with yellowish, distal border of the hindwing obsolescent and in the middle part much narrowed.

I. pandosia *Hew.* (20 d), from Venezuela, is white above and beneath, with black margins and above *pandosia*. **131** with black base, on the under surface of the hindwing with small red-yellow spots in the dark distal margin.

PERRHYARIS. By J. Röber.

teptatina. -- leptalina Bates (= pisonis Stgr.) is the form from the Upper Amazon. -- sabata Fruhst., from Colombia, 140 sabata is smaller than pandosia, has a diffuse transverse band on the discocellular and more deeply incised black distal margin, the underside is yellowish, the white spots of the forewing are smaller and the black bands ophelia. sharper. - ophelia Fruhst., from Peru (October), shows a stronger development of the black markings, larger 141 white spots on the under surface of the forewing and a more intensively red band on the underside of the 142 tudovica, hindwing. - Iudovica Fruhst, is the dry-seasonal form of ophelia; it is decidedly smaller and has the sub-

anal band on the hindwing narrower (February).

I. marana Doubl. (20 d). from Ecuador, is similar to pandosia, but has on the upperside broader black marana. margins and on the underside of the forewing a black subapical band as well as a similar median band on the under surface of the hindwing, which in the basal part is divided by a red-yellow band; the 2, which is vellowish white above, stronger vellow beneath, has on the upper surface of the forewing a black subapical band and broader black margins.

I. pisonis Hew. (20 d), from Colombia and Peru, differs from kiçaha Reak., from Honduras, in that pisonis. kiçaha, the black subapical band is complete above and beneath. Both forms have beneath at the margin of the forewing small white spots and at the distal margin of the hindwing a red-yellow macular band.

7. Genus: Perrbybris Hbn.

This genus differs from *Pieris* by the three-branched subcostal, there are no other sharp structural differences, but it is well characterised by the Heliconine-like style of marking, strongly developed in the $\sigma \sigma$ only beneath but in the \mathfrak{P} on both sides, which makes it probable that it belongs to another evolutionary stirps than the Pieris-species. Following the example of KAYE, we have removed the species with fourbranched subcostal, which are also well differentiated from *Perrhybris* in facies, especially by their slighter sexual dimorphism, and placed them with the preceding genus Itaballia.

P. lypera Koll. (20e), from Colombia (and Central America?), is in the S white above with black lvpera. apical part of the forewing and broad black distal margin on the hindwing, under surface of the forewing like the upper, hindwing yellow with broad black margin, a similar longitudinal band in the anterior part, in which is placed a short red band starting from the inner margin, and a black stripe at the costal margin. ² black above and beneath, similarly marked on both sides, on the under surface of the hindwing as in /4/ paraviciuii. the of a red half band. — paravicinii Fruhst., from Ecuador (Balzabamba), has longer and narrower wings, a decidedly narrower black distal margin, on the underside of the forewing the cell is lighter, the apical spot somewhat smaller, on the underside of the hindwing the margin narrower in the posterior half, the subbasal band white and pointed, central area light yellow proximally, distally white instead of dark vellow.

P. pyrrha F_{i} (= iphigenia *S*-hulz) is distributed from Central America to South Brazil (São Paulo) pyrrha. and from the east coast to the Upper Amazon. The upper surface of the $\sigma \sigma$ presents the facies of a typical White, whilst the \mathfrak{P} are similar to the Heliconines. The so-called type-form pyprha occurs in Surinam, from digitata. which digitata Fruhst., from Espiritu Santo, is distinguished in the or by a narrower black distal margin paudora, and in the 2 by an uninterrupted vellow band on the forewing. — The $\sigma \sigma$ of pandora form, nor. (20 e, f), from Rio de Janeiro and São Paulo, have a completely black hindwing except for a black marginal line, and reduced black markings on the forewing, the 2? a much broken, light yellow (commonly sulphur-yellow) 151 eieidias. band on the forewing. - eieidias Hbn. is probably a seasonal form from Surinam, with entirely white hindlucasi, wing in the of and very narrow black median band on the hindwing in the 2. - lucasi Fruhst., from Cavenne, is a 2-torm with very broad vellow band on the forewing, the red median band on the hindwing 153 pameta, being almost without dentition. - pamela Cr. is a 2-form with strongly developed black markings on the 754 amazonica, hindwing. - amazonica Fruhst. (= pyrrha Stgr.), from the Upper Amazon, has in the 3 a narrow black margin on the hindwing and in the 2 a moderately dentate band, red above and yellow beneath, on the 155 incisa, hindwing. - incisa Fruhst., from Bahia, flas in the of a broader margin on the hindwing than amazonicu, in the \mathcal{P} the much broken yellow band of the forewing is broadly margined with black near the base and 436 matenka. the red band of the hindwing is produced into fine points. - malenka Hew., from Venezuela and Colombia. has in the σ the upper surface of the hindwing entirely white and the under surface with only a few pale markings, the 2 has narrower wings, two red-brown bands reaching almost to the margin and only small 15 ostrolenka. subapical spots, whilst ostrolenka Stgr., from Chiriqui and Panama, is almost without markings beneath in 15 bogotana. the d and the \$2 are much darker beneath than malenka-\$2. - bogotana Bthr. (= Mylothris bogotana Bthr.), from Santo Fé de Bogotá, is in the 2 similar to malenka: the yellow-brown median spots of the forewing and the somewhat shorter submedian longitudinal stripes are sulphur-yellow at the margins; above and well separated from them are two yellow, obliquely placed spots and above the cell three oblong spots of the 159 glessaria. same colour in the oblique subapical row instead of the quadripartite band in malenka. - glessaria Fruhst., from Ecnador (Napo and Coca), has in the of above the marginal band deep black, but moderately broad,

Publ. 3. XII, 09.

v

PEREUTE. By J. Röber.

on the under surface of the hindwing with very broad and deep black markings, the 2 is a beautiful redbrown on the proximal two-thirds of the forewing above, with small but deep black markings, the yellow band occupying all the distal part of the area between the first two median veins very broad and brightly coloured, the hindwing is dark red-brown with broad and prominent black markings. The underside of the forewing is marked like the upper, only with somewhat paler colour, the underside of the hindwing is almost entirely black-brown and has only three narrow brick-red longitudinal stripes and at the anterior part of the distal margin three large lighter spots (not flame-shaped). — flammula subsp. nor., from Peru (Chanchamayo), flammula. 100 is a large form, in the or almost without any black at the distal margin of the hindwing, also beneath much less marked than glessaria, but with a considerable amount of sulphur-yellow at the distal and inner margins of the hindwing and some markings of the same tint also at the distal margin of the forewing. The ? has on the upperside but little red-brown colouring, strongly mixed with yellow, the four flame-shaped spots placed at the distal margin of the hindwing are lighter (vellower) than the proximal part and the black markings are much reduced, there is a conspicuous yellow spot at the base before the subcostal, the yellow band on the forewing is narrow and strongly dentate and the black markings are moderately developed. The under surface of the hindwing has a distinctive grey-yellow colour, the black markings at the distal margin are very pale in contrast to the rest of the black markings. — fruhstorferi form nov., from Panama, fruhstorferi. 70, is a 2-form with almost entirely black forewing. — carmenta Fruhst., from Peru, is probably the dry-seasonal carmenta. 703 form of flammula; it is considerably smaller and has fewer markings. - austriana Fruhst., from Bolivia, is austriana. 109 marked like glessaria on the forewing, the hindwing has a very narrow black distal margin. 2 above with lighter and more vivid yellow bands and spots than carmenta, distal margin of the hindwing somewhat broader, under surface of the forewing with more yellow spots, the under surface of the hindwing yellower and the red median band more distinct. - The $\sigma \sigma$ of this species, like most Pierids, are fond of moist places on the ground, the \$\$ of the forest.

P. flava Oberth. (20f), from the provinces of Leopoldina, Espiritu Santo and Bahia, must be regarded flava. as a separate species. The σ is yellow above and beneath with black apex to the forewing, in which the tooth-shaped projection between the 2. and 3. median veins, which all the forms of pyrrha possess, is wanting, the 2 has on the forewing a band which is sharply defined at both sides and on the hindwing a median band which is likewise yellow but of a deeper tint.

P. lorena Heic. (20 f), from Ecuador and Colombia, is white in the male above and beneath with lorena. black bands, the under surface of the hindwing, in addition to the black markings of the upper surface which may be seen in the figure, has also a black median band extending from the base to the middle of the wing, which is divided longitudinally by a red stripe, and a black stripe at the costal margin. The very differently coloured and marked 2 has the markings beneath much as above. - jumena Fruhst., from Ecua- jumena. 400 dor, is distinguished by a much narrower white subapical band which has the black bordering much broader; on the under surface the red band is reduced and its black border broader. - luteifera Fruhst., from Peru luteifera. 107 (Chanchamayo), shows in the σ^* the white subapical band running to a point posteriorly, so that a wedgeshaped instead of rectangular spot is formed, underside yellowish instead of white, underside of the hindwing in the marginal and basal areas more extended yellowish. - peruncta Fruhst., from Bolivia (Yungas peruncta. 161 de la Paz), has broader black bands and the white subapical transverse spot is more symmetrical and narrower, the under surface of the hindwing is more broadly margined with black than in luteifera and the subapical band much lighter red.

8. Genus: Pereute H.-Schäff.

The species of this genus differ widely from the typical Pierids in facies; in the style of marking they have a distant resemblance to some Heliconines, but the form of the wings is quite different; among the Pierids they stand with Archonias completely isolated. In neuration they agree with Leodonta: the subcostal is three-branched with one branch before the discocellular, the 2, and 3. branches form a moderately long fork, the precostal is weakly curved basad. The genus has its home about between 20° N. lat. and 30^o S. lat.

P. astodyca Bdr. (21 a), from the Brazilian province of Rio de Janeiro, is in the or black above, autodyca. scaled with grey at the apex and on the posterior part of the forewing as well as on the hindwing with the exception of the distal margin, in the middle of the forewing the red band of the under surface shows through indistinctly. The 2 is only scaled with grey on the basal part of both wings and bears on the middle of the forewing a broad brick-red transverse band, which is divided by the black veins. The dark under surface shows at the costal margin of the hindwing a large tear-shaped sulphur-yellow spot and at the base two red spots; in the of the red band of the forewing is narrowed in the anterior part, the of has further a white-red longitudinal band on the middle of the posterior part of the forewing. -- bardela Fruhst., bardela. 170 from Rio Grande do Sul, which according to the description is smaller, on the upperside darker and therefore with less grey and rose-coloured scales, also on the underside of the forewing on the red transverse band towards the costa whitish instead of rose-colour, can scarcely be distinguished from autodyca according

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PEREUTE. By J. Röber.

to my material; on the other hand a 2-aberration from Rio Grande do Sul with the band more pale red 171 rosa, deserves to be named separately as ab. rosa form. nor. - paula subsp. nor., from the province of São 142 paula. Paulo, is in both sexes above more plentifully scaled with grey, also at the distal margin of the hindwing in both sexes are large spots of grey scales, the ground-colour of the 99 is not pure black, but black-brown, and the under surface much lighter both in the ground-colour and in the colouring of the red band.

113 swainsoni. P. swainsoni Gray (21 a), from Parana, Santa Catharina and São Paulo, differs from autodyca by its larger form, above by a more distinct transverse band on the forewing and by the difference in the grey scaling, which is confined to the inner margin of the forewing and the basal half of the hindwing, and further by a vellow spot at the costal margin of the hindwing. On the under surface of the $\sigma \sigma$ the red median band present in the autodyca-d'd' is wanting on the posterior part of the wing. Both species fly 144 phalera. together in Rio Grande do Sul and São Paulo. — FRUHSTORFER has based the subsp. phalera (2Lb) on specimens from Rio Grande do Sul and Santa Catharina, but with the exception of the darker colouring of the under surface I have not been able to confirm the characters given by him.

P. cheops Stgr. (21 b), from Chiriqui, has a bluish black upper surface with slight gloss, the σ ^{*} has cheops. a median band of yellow scales, a similar one in the anterior part of the cell and sparse yellow scales at the inner margin of the forewing and on the basal part of the hindwing. On the lighter (black-brown) under surface the yellow band of the forewing is much broader and more distinct, at the costal margin of the hindwing stands a yellow band and at the base are two red spots. The 2 has a broad red band and yellow costal margin on the upperside of the forewing. Both sexes have yellow antennae.

P. charops Bdv. (21 b), occurring from Mexico to Panama (Chiriqui), is distinguished from the other charops. forms of this species by copious grey-white (σ') or reddish (\mathfrak{P}) dusting at the distal margin of the forewing. The median band of the forewing is brilliant yellow (σ^{γ}) or red (?) beneath. Both sexes have on the underside of the hindwing a long yellow stripe at the costal margin and a very small yellow stripe at the base. subvarians. — subvarians Stgr. i. l., from Colombia, has in the σ^2 less grey dusting on the upperside, and the median band of the underside is for the most part dull red instead of yellow. In the 2 the submarginal red dusting columbica. is absent from the upperside of the forewing. - columbica Fruchst., from Colombia, is distinguished by a general reduction of the grey dusting, which remains more distinct, however, in the middle cell; yellow spots are placed at the discocellular; median band of the forewing beneath yellow. This form appears to be cauca. only a *states* and the grey dusting of the σ is uniformly reduced everywhere, the median band is red instead of yellow for more than its basal half, and shows through on the upperside. The \$\$\$ have a very broad light red band on both sides of peruvianus, the forewing. — peruvianus Stgr. i. l., from Peru, has a broad yellow median band on the upperside of the forewing and distinct grey scaling on the apical part and the inner margin of the forewing; the hindwing has but little grey scaling. The under surface of the forewing has a sharp, sulphur-yellow median band. 17 meridana. Q unknown. — meridana Fruhst., from Northern Venezuela, has a strongly darkened upper surface without grey scales in and behind the middle cell and on the distal part of the hindwing, distal part of the median 182 praemeri- band on the underside of the forewing red. Amongst this form occurs ab. praemeridana Fruhst., which has dana. the band of the forewing beneath entirely yellow. — This species has white antennae.

P. leucodrosime Koll, (21 c). With this species, from Colombia, begins the series of those species leucodrosime. which have also in the σ^{2} a red band on the upper surface of the forewing. Ground-colour black, proximal half of the hindwing and basal part of the inner margin of the forewing with blue-white scales, thorax and abdomen with white hairs. The red band of the forewing above ends at the subcostal and is not prolonged basad. The under surface is black-brown, the veins and the stripes between them are black, at the base of the hindwing there are two small red spots. Antennae white. Specimens with the red band much reduced reducta. are ab. reducta form. nov. - In bellatrix Fruhst., from Peru, the red band of the forewing is lighter and bellatrix is not narrowed towards the margin, on the other hand the blue-white scaling on the proximal part of the beryllina. wing is reduced, under surface somewhat darker. - beryllina Fruhst., from Ecuador, has a narrower and tatona. deep red band on the forewing. - latona Btlr., from Venezuela, has on the upperside of the forewing only a red spot at the end of the cell instead of the red band. Among this form occur also specimens with entirely unicolor. black forewing: ab. unicolor ab. nor.

P. callinira Stgr. (21 c), from Peru, has black antennae. The upper surface as in *leucodrosime* is scaled callinira. with blue-white, the band of the forewing is of uniform breadth and in the middle cell continued somewhat towards the base, the basal half of the costal margin is finely, but sharply yellow, on the under surface of "40 musia. the hindwing the red basal spots are absent. ab. musia Fruhst., from North and Central Peru, is larger, the 19/ sabrina. red band much narrowed at both ends and rounded off. - sabrina Fruhst., from Colombia, has an essentially narrower red band on the forewing and more abundant blue scaling at the base, at the costal margin of 192 numatia. the forewing the red band is tinged with yellowish. - numatia Fruhst., from Bolivia, is smaller and paler, the red band broader, above in the middle more copiously scaled with black.

ARCHONIAS. By J. Röber.

P. callinice Fldr. (21c), from Venezuela, Colombia and South Peru, has likewise black antennae. callinice. The upper surface is black brown, the bluish scaling occupies the whole basal half of the hindwing but is completely wanting on the forewing. The light red median band of the forewing is only represented behind the discocellulars by a very small spot, is distally rounded and does not reach the distal margin. The under surface is as in *callinira*, but much lighter. The butterfly flies on forest-paths and is fond of drinking at moist places on the ground.

P. telthusa Hew. (21 c), from Peru and Ecuador, differs much from the preceding species. Antennae tetthasa. white. Upper surface black, with subapical yellowish macular band, small light submarginal spots, bluish white inner-marginal part of the forewing and blue-scaled basal part of the hindwing, which also shows small bluish marginal spots. The under surface is black, the forewing has the pattern of the upperside and the hindwing a small yellow stripe at the costal margin and also three red basal spots. - magna subsp. magna. nor., from the Lower Amazon (Obidos), is larger, the light area at the inner margin of the forewing is smaller and completely scaled with blue, the blue spots at the distal margin of the hindwing are larger, the under surface is darker and the yellow stripes at the costal margin of the hindwing very small. - boli- boliviana. viana subsp. nor., from Bolivia, has a broader and more strongly yellow subapical band on the forewing above and beneath. The light area at the inner margin of the forewing is larger on both surfaces and only scaled with blue at the margins, the blue spots at the distal margin of the hindwing are smaller, the under surface is somewhat lighter (more brown) and the yellow stripes at the costal margin of the hindwing longer and broader.

9. Genus: Archonias Hbn.

The characters of this genus are rather uncertain, the facies of the butterflies forms the best criterion for deciding as to their genus. The subcostal is four-branched, the 2. branch originates beyond the apex of the cell and the 3. and 4. branches form a short fork in the apex of the wing; yet this character is not constant even in one and the same species. It will be advisable to place in this genus only the tereas-like torms which mimie Papilio.

A. tereas Godt. (= iulus Hbn., \mathfrak{P} = marcius Hbn.). The specimens from Rio de Janeiro and Espiritu tereas. Santo may be regarded as the so-called typical form. It can scarcely be separated from **uniplaga** Fruhst. (21 d), from Rio Grande do Sul and São Paulo. This form is said to have only one white median spot on uniplaga. the forewing, which however among the material before me only occurs in one specimen from Santa Catharina; the remaining eight specimens from Santa Catharina and São Paulo have three median spots, one of which is placed in the cell. The 2 has always somewhat more white marking on the forewing and more red, of a deeper colour. on the hindwing. - critias Fldr. (21 d), from Venezuela and Colombia, is very variable as critias. regards the white marking on the forewing, the red marking of the hindwing is more extended and of a deeper tone than in tercas. To ab. hades Fruhst. belong specimens with the forewing entirely black above shades and to ab. nigripennis Bthr. entirely black specimens - approximata Bthr. is the form from Central America. nigripennis. and to ab. **nigripennis** *Bth*: entirely black specimens — **approximata** *Bth*: is the form from Central America. *approximata*. – **papilionides** *Frukst.*, from Honduras, has somewhat modified white spots on the forewing and three *approximata*. *intensively* carmine-red spots on the hindwing; beneath the spots on the wings are yellowish. – regillus regillus. *2ry* Fridst., from Ecuador, is smaller than tereas, the forewing has two white spots placed one under the other, the hindwing three small pale red, lighter-margined ones. - archidona Fruhst., from Ecuador (Balzabamba), arduidona. has a completely black forewing or at least but little white marking, and on the hindwing above and beneath yellowish or white instead of red spots. - rosacea Btlr., from Ecuador (Quito) and Colombia, has light red rosacea. spots on the upper surface of the hindwing. — "In Santa Catharina tereas begins to fly early in September as one of the first heralds of spring, and animates in well-watered valleys almost all the sweet-scented flowering shrubs with its quiet beauty and its delicately coloured garb" (FRUHSTORFER).

A. bellona Cr. (= \mathfrak{P} erycinia Cr., brassolis F., braselis Godt.), from Guiana, although regarded as a bellona separate species, is probably really another form of tereas, which is extraordinarily modified in the wooded west. A. bellona is but little different from negrina Fldr., from the Rio Negro. The or is black above with negrina. large light yellow spots on the forewing and red streaks on the under surface of the hindwing, whilst in the 2 the upper surface of the hindwing is also for the most part red. - cutila Fruhst. (21 d), from Ecuador, cutila. has large yellow spots on the forewing and three red streaks on the upper surface of the hindwing. - phaloreia. phalorcia Fruhst., from Peru, has black upper surface with small yellow spots on the forewing. - hyrnetho hyrnetho. Frukst. (21 d), from Bolivia, has more rounded wings than the preceding forms, the spots on the forewing are somewhat lighter yellow and a little larger, the upper surface of the hindwing is black, but the under surface has narrow red streaks, a yellow stripe at the costal margin and yellow marginal spots. In the \$ the hindwing above is for the most part red. — sabrina Fruhst., from Argentina (?), has very intensive yel- sabrina. low spots on the forewing, of which the curved one in the cell is very large; the underside of the hindwing is similar to that of hyrnetho, the yellow marginal spots are very small. Baron G. vox PLESSEN observed this species in large numbers and in both sexes in a thicket, so it may be assumed that the butterflies had emerged in this thicket; hence we may turther conclude that the larva is gregarious. The butterflies are fond of settling on leaves.

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pharnakia.

CHARONIAS; APPIAS. By J. Röber.

A. pharnakia Fruhst. (= archoniaoides Stgr. i. l.) (21 e), from Peru, is very different from all the above mentioned Archonias-forms, and is probably a separate species. The upper surface is black-brown with yellow spots on the forewing as on the underside, the hindwing is entirely without markings; 9 in the middle part of the forewing above and beneath brick-red.

10. Genus: Charonias Röb.

For the reasons given under Archonias it is necessary to place the following species in a separate genus. In the neuration there is a slight difference in that the two discocellulars of the forewing are of equal length and the upper discocellular of the hindwing is considerably shorter than the other two. The palpi are somewhat longer and stronger than in Archonias. Above all the external appearance is important in determining the genus.

Ch. eurytele Hew. (21 e), from Ecuador and Colombia, is brown on the proximal part of the wing eurytele. and black on the distal part, in the latter are placed yellow spots; specimens with white spots may be desalbimaculata, cribed as ab. albimaculata ab. nor. The under surface is quite similar to the upper, but there are rather lyceas, large white submarginal spots at the distal margin of the hindwing. - In lyceas Godm. and Salv., from Panama (Bugaba), there is only a streak-shaped spot of the brown colour of the forewing above present at dismorphitis, the inner margin, the under surface of the forewing is entirely black. - dismorphitis Btlr., from Chiriqui, dismorphina, has the forewing deep black with light yellow spots and the hindwing light brown. - dismorphina Stgr. i. l., from Colombia, likewise has the forewing very dark all over, with larger deep yellow spots, the hindnigrescens, wing being dark brown. - nigrescens Godm. and Sale., from Guatemala, is a still further darkened form. - The \$\$ are only somewhat larger, otherwise not different.

Ch. theano Bdv. (21e), from Brazil (e. g. São Paulo) is black with whitish streak-shaped spots. The 2 instead of white marks has dark yellow ones in the proximal and sulphur-yellow in the distal part of the wings. The under surface is similarly, but more copiously marked, the hindwing is yellow with black veins and black distal margin in which white spots are placed.

11. Genus: Appias Hbn.

In the neuration this genus agrees entirely with *Pieris*, but the $\sigma^2 \sigma^2$ have a special characteristic, namely two stiff tufts of hair (secondary sexual organs) on the anal claspers at the underside of the abdomen; the \$\$ are easily distinguished from those of *Pieris* by the peculiar colouring of the under surface, which is weaker-marked and has a slight pearly gloss. The genus is represented in India by numerous species, some of them beautifully coloured, and also in Africa by several species, but in America there is only one certainly distinct species, which until recently was classed with the genus Duptonoura. As the synonymous generic name Tachyris, given by Wallace, indicates, the insects belonging to this genus are extraordinarily active. According to the observations of Dr. A. SEITZ the Appias (especially drusilla) are only equalled in swiftness of flight among the butterflies by the representatives of the Hesperid genus Spathilepia; in a few seconds they traverse long distances. They not only fly extremely fast but also manage to take up their nourishment from flowers in the greatest haste. Only in imbibing water from the damp ground, where these insects, particularly the males, sometimes settle in large crowds close together, do they allow themselves time, and engage in this activity for the moment as an amusement.

A. drusilla Cr. (= ilaire Godt, margarita Hbn., albunea Dalm.) (21 f) is distributed from Southern drusilla. Florida to South Brazil, and is common. The or is white above, with slight blackish apical marking on the forewing, sometimes entirely without marking, beneath yellowish white without marking, only with a small yellow stripe at the costal margin of the hindwing. The \mathfrak{P} is white above on the forewing, on the hindwing yellowish, and has broad black margins, beneath white with a reddish sheen and very weakly developed markings similar to those on the upperside, as well as yellow dusting at the base of both wings, especially the forewing. The specimen figured by W. J. HOLLAND in his Butterfly Book on plate XXXV as 2 is according to the shape of the wings a σ with strongly yellowish upper surface and more strongly developed hollandi. black marking at the apex and basal part of the forewing; this form deserves special mention as ab. holjaneira. landi ab. nov. — janeira Bönningh., hitherto only observed in the Botanical Gardens at Rio de Janeiro, has also in the male yellow colouring at the base on the underside of the wings; v. BÖNNINGHAUSEN regarded it poeyi. as a distinct species. — poeyi Btlr., from the Antilles, has in the or no markings above and is somewhat more yellowish beneath; the 2 has more strongly yellow ground-colour and slighter marginal marking on the hindwing above, the underside is likewise more yellow than in drusilla-

theano.



CATHAEMIA: LEODONTA; CATASTICA. By J. Röber.

12. Genus: Cathaemia Hbn.

The forms belonging here were until recently united with Hesperocharis, but RADCL. GROTE erected the genus Cunizza for them. This name, however, must give way to the older one given by HÜBNER. It is true that the only difference in the neuration is that in *Hesperocharis* the upper discocellular of both wings is angled and has a short spur running into the cell, in *Cathaemia* on the contrary these veins are only slightly curved and have no spurs, but the great difference in the style of marking and the shape of the wings confirms the generic independence of the two.

C. hirlanda Stoll., probably from Surinam, is distinguished from the better known ninguida Fruhst. hirlanda. (= hirlanda Stgr.) (21 f), from Peru, by the broader black distal margin of both wings. - obnubila Fruhst., from ninguida. South Peru, has the hindwing almost black, so that only the cell and a few postmedian spots remain white. obnubila. 321 - fulvinota Btlr., from Rio de Janeiro, is completely white above except for the yellowish basal part of futvinota 223 the wings and the black costal margin of the forewing, the under surface is quite similar to that of hirlanda except that it has a red-yellow instead of a red marginal band on the hindwing. - praeclara Fruhst., from praeclara. 229 Espiritu Santo, is in the 3' of a beautiful light vellow on the upperside of the forewing, on the hindwing lemon-yellow with red band of the under surface showing through slightly, forewing with broad black distal margin, which at the 1. median vein is united with a black band starting from the costal margin, hindwing with narrow black margin, under surface similar to that of hirlanda, the black apical spot not joined to the subapical band, but separated from it by a yellow band. In the 2 the black margin of both wings is broader. -apicalis Fruust., from Ecuador, is intermediate between ninguida and obnubila. - helvia Latr. (21 f), said to apicalis. 230 231 be from Mexico (?), of which only specimens from Colombia are before me, generally regarded as a separate helvia. species, is in my opinion also a hirlanda form, because I have specimens which unmistakably form a transition. In this form the red marginal band of the hindwing beneath is wanting, yet most specimens have traces of it. The aberration which is suffused with light yellow on the upperside of the forewing and on the underside of the forewing coloured with yellow over the whole surface is named by FRUHSTORFER ab. serda; transitional forms, however, also occur. serda.

13. Genus: Leodonta Btlr.

The species of this genus were formerly classed with Percute. Although the two genera show no essential difference in the neuration and in the organs, they are yet sharply separated by their external appearance. But another character which is doubtless worthy of note consists in the formation of the anal claspers of the $\sigma \sigma$, which are much smaller in Leodonta than in Pereute. So far seven forms have been described, which have all been regarded as separate species, but I have only been able to recognise in them two species, one of which forms local races. — The butterflies fly over foot-paths and are fond of drinking at moist places on the ground.

L. dysoni Doubl. (21 e), from Venezuela, is the form which has the most white markings on the dysoni. upper surface, the hindwing is white with obsolete yellow spots at the base and broad black distal margin, which occupies about 1/4 of the surface of the wing, at the distal margin are placed larger white spots, the median band on the underside of the hindwing is white with one yellow streak in each marginal cell, and the rest of the hindwing beneath is lighter than in the other forms. - zenobina Horff. (21 e), from Peru zenobina. and Bolivia, has a broader black distal margin on the hindwing above and darker distal and basal parts on the hindwing beneath. — intermedia subsp. nor., from Northern Colombia (Cauca Valley), is smaller, the intermedia. 23 black distal margin of the hindwing is somewhat narrower than in zenobina and the basal part darkened, the median band on the under surface of the hindwing is broader and yellow, only the veins being very narrowly whitish, on the upper surface of the forewing in the cell at the point of origin of the 2. median vein there is a white spot, which also beneath is much larger than in the preceding forms. - In chiri- duriquensis. quensis Stgr., from Chiriqui, the black distal-marginal band of the hindwing reaches the discocellulars and at the distal margin there are larger white spots, the white median band of the forewing is narrower. -zenobia Fldr, from Colombia, is a smaller form with yellowish median band on the upperside, the basal zenobia. part of the hindwing is black, the light median band on the underside of the hindwing narrower, being interrupted in the middle. - In tagaste Fldr. (21 f), from Peru and Ecuador, the upper surface is for the tagaste. most part white, the hindwing has only a black margin. - marginata Schaus, from Venezuela (Merida), has marginata. half the forewing white, and 2 rows of small white subapical spots, the hindwing being similar to that of dysoni.

L. tellane Hew. (22 a), from Colombia, is yellow above with broad black margins, in which are tettane. placed yellow spots, the proximal part of the hindwing beneath is yellow, the base itself grey-brown.

14. Genus: Catasticia Btlr.

The only apparently certain difference in the neuration of this genus from that of Archonius consists in the second subcostal vein branching off either immediately at the upper angle of the cell or shortly before or after it. The external appearance of the representatives of this genus differs from that of Archonias

69

233

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CATASTICTA. By J. Röber.

to such an extent that their generic separation seems fully justified. Although the *Catasticta*-species exhibit a fairly uniform facies yet they form various groups, which however are mostly connected by transitions. The genus is distributed from Mexico to South Brazil, but has its proper habitat in the mountains of the west. The species doubtless vary considerably according to the locality, whether they also show seasonal forms has not yet been ascertained. According to P_{AUL} HAINEL the $\sigma^2 \sigma^2$ of the *Catasticta*-species have a habit of settling in the sunshine on water-washed stones at the banks of rivers, and drinking so greedily that the water comes out again in drops at the anus at short intervals. Not infrequently they are washed away by the water, which however does not harm them in the least, for immediately afterwards they rise like a waterbird out of the waves, in order to settle anew on the stone where they can reach the refreshing liquid.

(4) notha. C. notha Luc. (22a), from Venezuela, is above white with black apical and distal-marginal marking, very similar to the following species, beneath with white forewing, the apex of which is reddish grey, with small yellow stripes, hindwing diffusely red-white with yellow stripes in the cellules, distinct triangular yellow marginal spots and red basal spot.

Corcyra. C. corcyra *Fldr.* (22a), from Venezuela and Bolivia, is above very similar to the preceding, except that on the hindwing the dark markings of the under surface show through. Underside of the forewing white with black apex, in which yellow stripes are placed, hindwing yellow with black-brown veins edged with black-brown dentate median band and vestiges of a marginal lunate macular band. — In staudingeri Biller, from East Peru, the latter is completely developed. In this form the under surface of the hindwing is much lighter yellow and the black apical marking of the forewing only reaches to the second median vein. The ♀ has broadened black-brown apical marking of the forewing and black-brown spots at the distal margin of the hindwing above.

pieris. C. pieris Hopff. (22a), from Peru, is above white with black apical and subapical marking on the forewing and also a black marginal line on the hindwing. The under surface is white with brownish and yellow markings on the apex of the forewing. The underside of the hindwing is white, with a lunate line at the distal margin and in the middle, as well as similarly coloured markings at the base, where there is a laso a dark red spot; each area of the wing has a yellow longitudinal stripe. — innuba Stgr. i. l., from Bolivia, has yellow ground-colour above and beneath.

→ eurigania. C. eurigania *Hew.*, from Ecuador, is undoubtedly only a local form of straminea *Btlr.* (22 a), from *spots* on the forewing and somewhat different marking at the distal margin of the hindwing. The under surface has the typical *Catasticta*-marking.

theresa. C. theresa *Btlr.* (22 a), from Chiriqui, has the outer margin of the forcwing concave. The groundcolour is dark brown and the yellow markings are narrower than in *eurigania*. The under surface is similar, but the yellow markings are reduced in favour of the slightly glossy reddish-bluish colouring.

nimbice. bryson. the upperside. — *bryson Stgr. i: l.* (22b), from Mexico, has in the 3 stray-yellow, in the 9 ochre-yellow markings on *bryson.* the upper surface. — *bryson Stgr. i: l.* (22b), from Chiriqui and Guatemala, has broadened yellow markings on the upper surface, the under surface is somewhat lighter, especially at the base.

sinapina. C. sinapina *littr.*, from Peru, resembles *nimbica* on the upper surface, but the median band is more distinctly divided by the veins and the spots of which it is composed are smaller, the submarginal spots of the forewing and the marginal ones of the hindwing are larger, hindwing produced at the anal angle, under surface entirely uniform, ground-colouring mustard-yellow and the veins and markings purple-brown. Only known to me from the description.

- *pinava.* C. pinava *Dbl.* (22 b), from Bolivia and Peru, is above similar to the preceding species, but has narrower yellow markings and the wings more rounded. The hindwing beneath is suffused with more glossy white, and consequently lighter. The \$\2014 has above much lighter yellow, almost white markings.
- 25 vapina. C. vapina Bthr., from Ecuador, is most closely allied to pinaca, to which it is very similar on the upper surface. All the pale markings are lighter, more sandy yellow, except those at the distal margin, which are white. On the under surface colouring and markings are very similar to phil.thea, but all the light areas are larger and sharper, the ground-colouring of the forewing is light chamois, of the hindwing pearly white, suffused with sulphur-yellow on the proximal half, the white marginal markings are as in manco, apex and distal margin of the forewing similarly coloured. Only known to me from the description.
- 54 colla. C. colla *Dbl.* (22b), from Bolivia and Peru, has above black-brown ground-colour with deep yellow macular median band and a submarginal row of small yellow dots on the forewing, broader yellow median band and some yellow marginal spots on the hindwing. The under surface is very gay on account of its
CATASTICTA. By J. Röber.

silver-white, sulphur- and orange-yellow, and also brownish and black spots, the arrangement of which may be seen from the figure. - jacinta Btlr. (22 b), from Bolivia (seasonal form?), has much more yellow on jacinta. the upper surface. The under surface is less variegated on account of the almost complete absence of the plesseni. silver-white markings. - plesseni subsp. nor., discovered by Baron G. v. PLESSEN in Ecuador (Baños), is somewhat smaller than colla, and has above lighter yellow median bands and more distinct submarginal spots; beneath all the vellow markings are likewise lighter and the ground-colour of the hindwing purer white, without reddish flush.

C. chelidonis Hapff. (22 c), from Bolivia, has broader and more distinct yellow markings than philo- delidonis. mene Stgr. i. l., from Bolivia (seasonal form?). The under surface in both forms is quite similar, only cheli- philomene 150 donis has more yellow markings on the forewing, particularly in the middle. - The small form from Ecuador with sharper yellow markings may be differentiated as acquatorialis form. nov. aequa- 254 torialis.

C. hopfieri Stgr. i. l. (= pinava Ettr., nec Dbl.) (22 c), from Bolivia, is much smaller than the preced- hopfieri. ing species, but the submarginal yellow spots are much larger and both wings have small yellow marginal spots. On the underside of the hindwing the median markings are separated from the marginal spots by a sharply defined band of silver-white heart-shaped spots, the yellow markings are not orange, but sulphuryellow. - Specimens with darkened upper surface are in the market as forma obscurior Stgr. i. l.

C. teutanis *Hew.* (22 c), from Peru and Ecuador, gives on the upper surface the impression of a small *teutanis*. Pareronia. Upper surface white, on the basal part of the forewing and the whole of the hindwing bluish white on account of the dark colouring of the under surface showing through, the apical half of the forewing black with small bluish white subapical and submarginal streaks, the hindwing with rather broad, deeply indented black distal margin. Under surface with the exception of the middle part of the forewing brownblack with slight vellow marginal and submarginal markings and two dark red basal spots on the hindwing.

C. ctemene Hew. (22 c), from Ecuador, has the apex of the forewing produced. Upper surface white ctemene. with black-brown apical and basal parts and black-brown marginal spots on the forewing; in the dark apex of the forewing are placed small white subapical spots. The underside of the forewing is white, that of the hindwing bluish brown with diffuse Catasticta-markings.

C. prioneris Hopff: (22 c), from Peru, is white above with black-brown markings at the margin and prioneris. 304 at the base. Under surface white with bluish brown and sulphur-yellow Catasticta-markings and two red basal spots on the hindwing. 9 has much broader marginal markings, particularly on the hindwing. - cau- caucana. 265 cana subsp. nor., from Cauca in Colombia, is distinguished by the want of the white submarginal spots of the forewing and slight black marking at the distal margin of the hindwing. The under surface is paler. Here The \$\$ have above larger white spots at the discocellular than prioneris-\$\$.

C. sisamnus F., from Peru, has black upper surface, a broad white median band and white marginal sisamnus. 266 and submarginal dots and spots. The markings of the under surface correspond to those of the upper, median band vellowish white with small vellow stripes, marginal and basal areas black-brown with small marginal and submarginal spots and two red basal spots on the hindwing. - telasco Luc., from Chiriqui, has on the telasco. V 201 hindwing narrower black distal margin and the white submarginal spots on the forewing are larger, the median band of the forewing is narrower and the under surface somewhat lighter. - pitana Fldr, (22 c), pitana from Colombia, has the median band still broader and very sharply defined, being in the or white, in the ? white or yellowish; ?? with lemon-yellow median band and spots of the same colour may be distinguished as 2-f. flava form nor. 64 flava.

C. bithys Hbn. (22 d) occurs from Mexico to South Brazil. Upperside black-brown with narrow vhitish bithys. macular median band, small white marginal and submarginal spots; sometimes one or the other row is wanting. Underside with small yellow stripes in the white median band of the hindwing, marginal part reddish black-brown, with small marginal and submarginal yellow spots edged with black. ? not different.

C. troezene 11drz (22 d), from Colombia, has black-brown upper surface with white macular median troezene. band, darkly dusted over, distinct submarginal and indistinct (in the forewing sometimes absent) marginal spots which on the hindwing are small but distinct. Under surface much marked with sulphur-yellow.

C. troezenides Styr. i. l. (22 d), from Colombia, though very similar to troezene beneath, has less troezenides. vellow marking and broader black-brown marginal marking. Above differing somewhat in the greater part of the hindwing being white. In contrast to the hindwing the forewing shows less white markings than troczene.

C. hebra Luc. (22 d), from Colombia, is similar to troczenides above, but the black margin of the hebra. hindwing is broader and dentate, the under surface however is rather different through the want of sharp Catasticto-marking. The underside of the hindwing is reddish brown with light submarginal and median bands, distinct triangular sulphur-yellow marginal spots, oblong sulphur-yellow submarginal ones and sulphuryellow stripes in the proximal part of the wing.

71

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250

obscurior 26

270

CATASTICTA. By J. Röber.

- strigosa. C. strigosa Btlr., from Peru, is in form, size and general appearance like hebra, deep olive-brown, the last third of the middle cell of the forewing shows sparse sulphur-yellow scaling, the cell is surrounded by a row of oblong, pointed sulphur-yellow-brown streaks, the outer part of the first six streaks is divided by the ground-colour, hindwing sulphur-yellow-brown, but the veins and the distal margin olive-brown, three elongated light yellow spots bound the 2. to 4. interneural stripes. Under surface similar to that of *ctemene*, but the yellow spot on the forewing divided into narrow streaks by the broadly brown-edged veins. Only known to me from the description.
- Crowleyi. C. crowleyi Btlr., from Venezuela (Monte Sierra and Culata), is similar to strigosa. Upperside dark purple-brown with whitish ash-grey areas and spots, the distal margin of the hindwing and the veins are sharply prominent; an orange-yellow spot at each side of the prothorax; under surface almost as in actinotis, but the hindwing of light reddish brown colour, without sharp median band, the yellow spots only edged with dark brown marks. Only known to me from the description.
- semiramis. C. semiramis Luc. (22 d), from Colombia, is above obscure grey-black with indistinct yellowish white submarginal and central spots, but beneath brilliantly marked. The hindwing is remarkable for the abundant sulphur-yellow markings, which are paler on the forewing, and the sharp hlack and snow-white markings.
 - *niobe.* **C. niobe** Stgr. i. l. (22d), from Bolivia, is above black-brown with indistinct yellowish submarginal and central spots on the forewing and light subbasal band on the hindwing. The ground-colour of the hindwing beneath is a light sulphur-yellow, on which the black and the dark sulphur-yellow, black-edged markings stand out well. The forewing has black-brown ground-colour with light marginal, submarginal and central spots, which are sulphur-yellow in the anterior part and white in the posterior.
 - Suasa. C. suasa Stgr. i. l. (22e), from Bolivia, has very dark, black-brown upper surface, with obsolete whitish submarginal and central spots. The under surface of the lindwing is very variegated, with silver-white, sulphur-yellow, reddish brown and black-brown markings. The under surface of the forewing has black-brown ground-colour and white submarginal and central spots, as well as very small, white, anteriorly suasetta. yellow, oblong marginal spots. suasella subsp. nov., from Peru. is above much lighter (vellowish grey) and beneath much less sharply marked; the light markings on the underside of the forewing are yellowish and much more extended in the middle.
 - modesta. C. modesta Luc. (22 e), from Peru. has the upper surface grey-brown with slight obsolescent light submarginal and central markings. The under surface of the forewing is yellowish with brown and dark yellow marginal markings, the underside of the hindwing is reddish brown with diffuse silver-white subactinotis. marginal and central bands and dark yellow markings. — actinotis Bthr. (22 e \Im), from Costa Rica and Chiriqui, has more extended yellowish markings above and darker coloured under surface. The \Im is above black-brown with yellow disc on the forewing, which is intersected by the dark veins; the underside the same.
 - C. manco Dbl. (= incerta Dogn.) (22 e), from Bolivia, has black-brown upper surface with submanco. marginal and central markings on the forewing, and on the hindwing marginal and submarginal markings, all ashy grey, as is also the base. The underside of the hindwing is silver-white with narrow black markings and broad sulphur-yellow ones. The ground-colour of the forewing beneath is impure white with a marginal lunate line, which is sharp and black in the anterior part, black-brown and not sharp in the posterior, the blackbrown submarginal band and similar coloured basal part with light stripes; in the apex there are sulphurphilothea. yellow spots. — philothea Fldr., from Colombia, is above somewhat more yellow, on the underside of the philoscia. hindwing less yellow, but more strongly marked with black. — philoscia Fldr., from Venezuela, is less yellow on the whole upperside and on the underside of the forewing still more yellowish; can scarcely be separated from philothea.
 - anaitis. C. anaitis Hew. (22e), from Ecuador, has ash-grey-yellowish upper surface with black-brown margins and small light submarginal spots. The under surface is silver-white with sulphur-yellow, black and brownish markings.
 - *reducta.* **C. reducta** *Btlr.*, from Ecuador, is above like *anaitis*, but much smaller and all the spots of the upperside are ochre-yellow, irregularly coloured with purple-brown, the veins are much more broadly blackish, the hindwing has a row of small white marginal spots, the macular band on the underside of the forewing *boliviana*. is lighter ochre-yellow and the forewing is more falcate. **boliviana** *Btlr.* differs in the light ochre-coloured spots on the under surface, which shows scarcely any admixture of dark. Only known to me from the description.
 - sordida. C. sordida *Bitr.*, from Bolivia, has the general colouring of *anaitis*, but is less yellow, the spot at the end of the cell and the spots of the central row of the forewing next to the costal margin are smaller. Distal margin of the hindwing blackish, occupying almost half the wing and crossed by spots of the ground-colour. Beneath all the light marks are reduced and the brown areas much broader, the light bands are cream-coloured, not pure white, and the yellow stripes and spots of a deeper colour.

Publ. 6. XII. 09.

CATASTICTA. By J. Röber.

C. flisa H-Schäff. (22e), from Colombia, has black-brown upper surface with white macular median flisa. band, submarginal and very small marginal white spots; in the 2 the anal area of the hindwing is yellow. The under surface is black-brown with a white macular median band, in which on the hindwing yellow spots are placed, the marginal spots being present as above, but whitish yellow.

C. chrysolopha Koll. (= xeque Mengel) (22 f), from Ecuador, has black upper surface, on the drysolopha. forewing a white macular median band and small diffuse submarginal white spots, the hindwing has a median band which is bright ochre-yellow in the middle and white anteriorly, and likewise small, diffuse submarginal white spots. The under surface of the hindwing is yellowish white with sulphur-yellow and black markings. The 2 has rounder wings, is paler above and beneath and has on the hindwing also small light spots.

C. apaturina Bth. (22 f), from Ecuador, is very similar to the preceding species, but has smaller apaturina. white spots and on the hindwing a narrower and light yellow median band. The under surface of the hindwing has almost snow-white ground-colour and ash-grey submarginal markings and more black markings in the middle.

C. toca Dbl. (22 f), from Bolivia and Colombia, has black upper surface with white macular median toca. band and diffuse white submarginal spots. Under surface of the hindwing white with black marginal band of lunate spots and black median band composed of wedge-shaped spots, and also black basal markings; in each cellule is a sulphur-yellow streak. Under surface of the forewing black with white submarginal and 213 median bands as well as yellow marginal spots. - detrita form nov., from the Upper Amazon, is much detrita. paler above and beneath.

C. scaeva Stgr. i. l. (22 f), from Peru. Upperside dark brown with yellow or yellowish macular scaeva. 244 median band and submarginal spots of the same colour, underside paler yellow than in toca with brownish and (particularly on the hindwing) somewhat different markings; the line at the margin is composed of acute triangles.

C. tomyris Fldr. (22 f), from Colombia and Venezuela, is above similar to toca, but larger. Upper tomyris. surface black with white macular median band and small white submarginal spots on the forewing, hindwing with vellowish median band. Under surface of the forewing black with submarginal and median macular bands and vellow marginal spots. Hindwing light vellow with black lines of lunate markings at the distal margin, black central and basal spots and a sulphur-yellow stripe in each cellule. 2 not different. - tamina tamina. Stgr. i. l., from Bolivia, has above a broader median band on both wings and on the under surface of the hindwing reddish-bluish colouring at the distal margin and in the basal area, with pure white ground-colour.

C. cora Luc. (= zancle Fldr.) (22 f, g), from Venezuela and Peru, is above dark grey with marginal cora. and submarginal black bands. The under surface of the forewing has submarginal and median white macular bands with small yellow spots and yellowish white marginal spots. The under surface of the hindwing is marked with a confusion of white, yellow, black, brown and bluish.

C. uricoecheae Fldr. (22 f), from Colombia, one of the most beautiful species of the genus, is very uricoecheae. similar to cora on the upperside of the forewing, but has dark red hindwing with black distal margin and black macular median band. The under surface is also very similar to that of cora, but much lighter.

C. cinerea Btlr., habitat unknown. Forewing above ashy grey, costal margin and yeins broadly cinerea. black, distal quarter of the wing occupied by a broad black margin, in which are placed a row of whitish green spots and a row of very small white marginal spots, basal half of the hindwing ashy grey, irregularly scaled with black, distal half black with a row of whitish grey spots and a row of small sulphur-yellow marginal spots. Body blackish, palpi with two white lateral lines, throat with a small yellow spot at each side. Under surface very similar to that of uricoechiae, but the grey areas more slate-coloured, the yellow marks deeper in colour, all the light markings sharper and those on the forewing broader. Only known to me from the description.

C. vulnerata Bthr., from Ecuador, is similar to uricoecheae, but the basal area of the forewing also vulnerata. is red, the median band narrower, the red of the hindwing more restricted and greyer, the median bands are smaller, lighter red and diffuse, the inner margin is whitish. On the under surface the markings are sharper, the yellow marks more glossy, the grey central band of the hindwing is fairly straight on its inner side and is on that account broader, its white and yellow borders are narrower, the marginal spots broader, somewhat less angled. Only known to me from the description.

C. tricolor Btlr., from Ecuador, is also similar to uricoecheae, but all the spots on the upper surface tricolor. of the forewing are glossy lemon-yellow, the scarlet of the hindwing is less brilliant, the spot towards the base more reduced, a row of yellow marginal spots present. On the under surface the white and yellow markings are so much reduced that the ground-colour appears grey.

C. paradoxa Step. i. l. (22g), from Peru, is likewise a very beautiful species. Underside shiny black paradoxa. with light yellow submarginal and central spots on the forewing and bright yellow median band and submarginal spots on the hindwing. Under surface of the forewing black with submarginal and median white

73

CATASTICTA. By J. Röber.

macular band and small yellow marginal spots. Under surface of the hindwing white with black marginal line and black lunate line before it, black median sagittate spots and markings of the same colour in the basal area, all the black markings edged with pale ochre-yellow and small ochre-yellow stripes in all the cellules.

C. teutila *Dbl.* (= sebennica *Luc.*) (22 g). Sexes rather different. Upper surface glossy blue-black, teutila. or with narrow white median band sprinkled with dark, and small marginal and submarginal spots of the same colour, in the 2 the median band at least double as broad and dark yellow. Under surface grey-black, forewing with the markings as above and small yellow marginal spots, hindwing with yellow, white and black spots. From Mexico.

C. marcapita Thieme i. l. (22g), from Bolivia, has the forewing black above with wedge-shaped marcapita. central yellow spot and yellow submarginal spots, upper surface of the hindwing yellow with black marginal lunate line, blackish, diffuse central spots and narrowly black veins. Under surface yellow with black marginal lunate line on both wings, black submarginal band and blackish basal part of the forewing, black wedge-spots and black markings in the basal part of the hindwing.

C. clara spec. nor. (22g), from Ecuador, has the upperside of the forewing light yellow with broad, clara. glossy black margin, in which are placed a row of light yellow submarginal spots and two light yellow spots at the costal margin on the discocellulars. Upper surface of the hindwing light sulphur-yellow. strongly dentate, the dentition edged with black and the veins narrowly black, basal part of both wings likewise black. Under surface of the forewing white with black marginal and submarginal dentate markings, small vellow spots in the apex, the discocellulars and the basal area black. Hindwing yellow with narrow black marginal, medial and basal markings, all the veins narrowly black.

216 eximia. C. eximia spec. nov. (22g), from Bolivia, is similar to the preceding species, but smaller, hindwing likewise dentate, though not so strongly. Above on both wings with larger black basal area, forewing light yellow with black marginal and submarginal bands as well as black median spot, hindwing deeper yellow with dentate black marginal band and submarginal black spots. Under surface of the forewing yellower, that of the hindwing lighter, the latter with less deeply dentate black markings, likewise all the veins narrowly black.

C. radiata Koll., from Colombia, is similar to nimbice, but yellower, the under surface of the hindwing is much marked with red, and in the centre of the hindwing are two white spots.

C. emeris *Bdv.* Size and shape as *nimbice*. Forewing whitish yellow with blackish, proximally dentate margin, the apex uniformly blackish, a small blackish streak at the discocellular, joined to a larger spot at the apex. Hindwing ochre-yellow, distal margin with a row of small, wedge-shaped black spots along the veins. Under surface of the forewing as the upper, but with a row of yellow spots at the margin. Under surface of the hindwing blackish with a row of yellow marginal spots and ten or eleven white spots marked with vellow, the largest of which fills up the whole of the cell, a large blood-red spot at the base. Chile and Brazil. — Only known to me from the description. This and the preceding species might well be placed after nimbice.

C. susiana Hopff. differs from chelidonis by the longer, narrower forewing, which has exactly the same susiana. shape as in *nimbice*, and further by the ochre-yellow spots and bands of *chelidonis* being white, as well as by the form of the discal band. The latter is considerably narrowed in susiana, especially in the forewing, where it is only half as broad as in *chelidonis* and more divided into spots, the veins being broader. Its white colour, which in the forewing is dusted with black atoms, has in the hindwing a slightly yellowish tinge. The marginal dots at the end of the internervular folds, which are only indicated in *chelidonis*, here become distinct but very small white triangles, on the other hand the small white spot in the cell is extremely minute and indistinct. — Only known to me from the description; might be placed after chelidonis.

C. alma Hopff., from Bolivia, is rather unlike the other species on the upperside. It is distinguished alma. by its yellowish white ground-colour, by the deep black veins of both wings, by the broadly black costal margin of the forewing, which occupies the greater part of the cell and of the base, and by the distal margin of the forewing, which is broad at the apex, narrows behind and is proximally bounded by a sharp, straight line and adorned in its whole length with small, fine, wedge-shaped yellowish white spots, whilst the rather broad black distal margin of the hindwing mostly shows yellowish white dots between the veins; the under surface of the hindwing resembles that of telasco and pitana Fldr., but its markings are much more diffuse and indistinct. - Only known to me from the description. Might well be placed after sisamnus.

MI suadela. C. suadela Hopff., from Bolivia, has the forewing broader than in suasa, the ground-colour of the upper surface is darker, the median macular band reduced to small obsolescent spots, the submarginal spots are very small, dot-like, but sharp, on the hindwing the median band is completely obsolete, the submarginal spots are very small and indistinct. The under surface has smaller white spots and less yellow markings. Should be inserted after suasa.

DAPTONOURA. By J. Röber.

15. Genus: Daptonoura Btlr.

The species of this genus resemble Appias, but do not show such strong sexual dimorphism. The secondary sexual character peculiar to the $Appias -\sigma^2 \sigma^2$ (tuft of hair on the underside of the abdomen) is wanting in those of *Daptonoura*. In the neuration this genus agrees with *Pieris* except in the shape of the precostal, which is curved proximad. This genus is confined to tropical America. Recently the name *Melete Swains*. has been employed for this genus, but it would be better to continue to use the well-hnown name *Daptonoura* instead. *Heliochroma Bib*: appears to belong here. The species of *Daptonoura* are extraordinarily prone to the formation of local and aberrational as well as seasonal forms, but it is very difficult correctly to fix the limits of either the species or the individual forms. The butterflies, which are very common locally, love the shade of the woods, are fond of congregating at water and have a slow, gentle flight. They fly principally in December to January, singly all through the summer.

D. lycimnia Cr. (= flippantha F.) (23 a) presumably comes from Surinam; the form from Venezuela, lycimnia. a specimen of which is figured, is probably not essentially different. Upper surface white with black apical and distal margin of the forewing and narrow ones of the same colour on the hindwing; sometimes a black spot in the middle of the costal margin of the forewing. Under surface yellow with broader black-brown distal margin and a black-brown spot at the costal margin of the forewing on the discocellulars; groundcolour yellow, lighter posteriorly on the forewing. - harti Bt/r., from Trinidad, is smaller than eurymnia harti. 313 Fldr., has the distal margin of the forewing more concave and the marginal band somewhat narrower, especially behind the 2. median vein; the hindwing sulphur-yellow, the dark brown distal margin very narrow; ground-colour of the under surface glossy canary-yellow, the basal area deep orange. The \hat{z} differs but little. - phazania Fruhst., from Bahia, comes between lycimnia and pantoporia Hon. - pantoporia Hon., phazania. from South Brazil, is a very variable form; it has the distal margin of the hindwing sprinkled with yellow pantoporia. or sometimes only a narrow black marginal line. It includes the following forms: 2-f. fiora Fruhst. (23 d), fiora. 316 with dark vellow ground-colour on both surfaces, broader marginal bands and larger spots in the distal margin of the hindwing above; 2-f. pertho *Fruhst.*, with pure white forewing and dark lemon-yellow pertho. hindwing margined with bright red. — limnoria *Godt.* forms the transition to *pantoporia Hbn.* (from Espiritu *limnoria* 200 Santo and Rio de Janeiro), which again is only a little different from petronia Fruhst., from Santa Catharina, petronia. 101 Theresopolis and Rio Capivary. Upper surface of the forewing slightly yellowish white with narrow black apical and distal-marginal markings, the hindwing light sulphur-yellow with very narrow black margin. Under surface deeper yellow with broader dark brown distal margin and spots of the same colour at the middle of the costal margin of the forewing; as always, the posterior area of the forewing is much lighter, almost 320 white. With it occurs 2-f. daulia Fruhst., with the forewing white above instead of light yellow. - daulia. paulista Fruhst., from São Paulo, has broader black apical and distal-marginal markings on the forewing, paulista. pure white upper surface and straw-yellow colour on the under surface. But d'd' also occur in which the upperside of the hindwing is a beautiful lemon-yellow and the underside almost the same, but deeper yellow: **paula** form nor. (23 a). The \mathfrak{P} vary likewise; if the almost white \mathfrak{P} are referred to paulista, the strongly paula. yellow coloured 22 with broader black markings must be treated as paula-22. - gargaphia Fruhst., from gargaphia. Rio Grande do Sul, is smaller than petronia, has the brown-black distal margin of the hindwing scarcely visible in the or and only about 1 mm. broad in the 2 and narrower markings at the apex and distal margin of the forewing. Under surface in the J whitish yellow, in the 9 pale straw-colour; rare. Among it occurs: f. amarella Frenkst., entirely yellow in both sexes, also the 3 with black cell-spot on the forewing. - amarella. 30 calymnia Fldr. (= leucadia Fldr.), from the Rio Negro, is yellow and has a broad distal margin to both calymnia. 32 wings above and beneath and in the margin of the hindwing 4 yellow spots; f. theodora Fruhst, the rainy- theodora. season form, is more beautiful yellow, has still broader dark margins, is suffused with light yellow on the basal half of the hindwing above and the underside, with the exception of the posterior half of the forewing, 88/ is almost canary-yellow. - marica Fruhst. (= leucadia Stgr.), from the Upper Amazon, has very broad marica. apical border and more or less yellowish ground-colour, also very narrow distal margin of the hindwing. 300 f. moesia Frahst, differs from it in the much broader distal border of both wings. - eurymnia Fldr., moesia. from Colombia, has above mostly an apical spot which is almost rectilinear towards the base, and very narrow eurymnia. black distal margin on the hindwing. The under surface is sulphur-yellow. The dry-season form, asta Fruhst., asta. has narrower and more deeply incised apical spot on the forewing, yellowish instead of white upper surface and pale ochre-yellow under surface. - aelia Fldr., from Ecuador and Colombia, has the upper surface aelia. white with rather broad apical spot, unevenly defined proximally, and very narrow black margin on the hindwing. The under surface is greenish yellow with conspicuous ochre-yellow basal spot on the hindwing. - huebneri Btlr. (23 d), from Brazil (Leopoldina), is smaller than limnoria, the black apical margin narrower, huebneri. 322 regularly dentate proximally, the hindwing is glossy sulphur-yellow with broad orange-yellow, black-edged distal margin. The φ is likewise smaller than *limnoria*, the median spot is sometimes connected by a stripe with the distal margin, the hindwing as in the or, but the orange-yellow distal margin broader. - napona napona. 373 Frukst, from Ecuador (Rio Napo), is larger than aelia, distal margin of both wings broader, that of the hindwing as in moesia, showing through from the underside, in the σ the apical third of the forewing beneath

DAPTONOURA. By J. Röber.

light yellow like the hindwing, in the 2 the forewing pale yellowish, the hindwing sulphur-yellow, the black distal margin with five diffuse canary-yellow spots, under surface of the forewing sulphur-yellow, of the 1¹⁴ pistoria. hindwing canary-yellow. ♂-f. pistoria Fruhst., from the Rio Napo (Ecuador), has still broader distal margin 35 latilimbata. of both wings and pure white under surface. In 3-f. latilimbata Btlr., from Ecuador, the distal margin of hypoxantha. both wings is broad and brown. — hypoxantha subsp. nov., from Cuba, is smaller, has narrower black palaestra. margins and yellow under surface. — palaestra Hopff., from Peru (Pozuzo), has deep black apical third, regularly defined proximally, narrow, sometimes extremely narrow black margin, pure white upper surface at pedrosina. and very light yellow under surface with broader distal margin on the hindwing. With it occurs f. ped-33 maeotis. rosina Btlr., with the under surface completely white. - maeotis Fruhst., from Peru, has the wings narrower. Upper surface in both sexes entirely white, or with obliquely placed black apical spot, which extends to the 1. median vein, φ with rectangular black median spot on the forewing, under surface light ochre-Wiphigenia. yellow. Among them occur the following aberrant forms: iphigenia Frukst., with broader, deep black apical spot, wings on both sides pure white, σ with thread-like black distal margin, widened into small spots at the middle veins, $\hat{\gamma}$ with broad black discocellular on the forewing and broader distal margin on the hindvelia. wing, marked with five white dots, under surface with grey-black distal margin on both wings; velia Fruhst., 341 from Tarapoto, has the shape of macotis, of above purer white with equally broad, deep black distal margin on both wings above and beneath as in *iphigenia*, under surface of the forewing pure white except the sub-M² radiata. apical area, hindwing above beautiful light yellow; radiata Fruhst., from Tarapoto, has the apex of the forewing slightly rounded, upper surface in the σ yellowish white, distal margin moderately broad, hindwing 1 myrtis. above yellowish, distal margin brown, running off proximally into fine streaks along the veins. - myrtis Fruhst. (= lycimnia Stgr,), from South Peru (Cuzco), has the upper surface white with narrow black apical part and also narrow black margin on the hindwing, underside of the hindwing lemon-yellow, margin grey-3^{ull} donata. brown. — donata Fruhst., from Bolivia (Coroico), recalls peruviuna Luc. Upper surface white, hindwing especially at the inner angle slightly suffused with light yellow; under surface similar to macoris, underside of the hindwing and (as usual) the costal margin of the forewing canary-yellow, apical spot narrow, blackbrown, proximally strongly undulate, black cell-spot pointed posteriorly, hindwing with very narrow black marginal line, which only at the veins assumes the form of small pointed teeth; probably a dry-season form. 105 bianca f. bianca Fruhst., from Bolivia (Yungas de la Paz), is above entirely white without any yellowish tinge, with extended deep black apical spot and the distal margin of the hindwing scarcely 1 mm. broad, under surface pure white with pale yellowish subapical area and the anterior half of the hindwing slightly suffused pseudo- with yellow; distal margin grey, on the hindwing about 2 mm. broad, cell-spot distinct. — pseudomyrtis myrtis. Fruhst., from Yungas de la Paz, recalls maeotis and in the shape of the wings aelia and myrtis, but differs from myrtis by a somewhat more extended black distal margin on both wings and by the apical spot on monica. the underside of the forewing being brown instead of black. - monica Fruhst., from Bolivia, recalls iphigenia by the very broad apical margin of the forewing and the ventricose projection in the middle of the hindwing; the dull chalk-white hindwing has a light yellow distal margin about 2 mm. broad, which is adorned with some black spots. Under surface with brown distal margin and triangular spot at the apex 🖞 cuccadia. of the cell of the forewing, otherwise washed-out straw-yellow. — leucadia Fldr. (23a), from the Rio Negro and Bolivia, is white above, with moderately broad black apical spot on the forewing and very narrow distal margin on the hindwing; the black median spot of the forewing shows through somewhat above; underside of the forewing light sulphur-yellow, darker at the costal margin, hindwing light ochre-yellow, the narrow distal margin of the hindwing, the apical and the oblong median spot as well as the costal margin of the forewing are grey-black. D. peruviana Luc. (23a), from Peru (Pozuzo), occuring up to 10,000 ft., has white upper surface, , peruviana. a narrow, sharply dentate apical spot on the forewing and very narrow, sharp distal margin on the hindwing; under surface whitish yellow with slight gloss, sharp black veins on the hindwing, diffuse apical spot

wing; under surface whitish yellow with slight gloss, sharp black veins on the hindwing, diffuse apical spot yolanda. and similarly indistinct discocellular on the forewing.
f. yolanda Fruhst., from Peru (Chanchamayo), is galatia small, has larger black apical spot, and the under surface of the hindwing is straw-yellow. — galatia Fruhst., from Bolivia, has the upper surface yellowish, the black apical spot reduced and the under surface almost without markings except for the black veins of the hindwing, only the apex of the forewing being being frequides.
*regnidas. slightly tinged with grey. — regnidas Fruhst. (23 c), from Ecuador, shows extended black apical margin of the forewing, which, however, is more feebly dentate. ♀ orange-yellow.

Laria. D. laria Fldr. is the Colombian form of Iouisella Fruhst. (23 a), from Peru, from which it differs louisella. but little. Both, as also the following Bolivian form, are probably only forms of peruviana. In louisella the upper surface is pure white, the not very broad apical spot of the forewing and the sharp and very narrow distal margin of the hindwing are deep black; the under surface of the forewing is yellowish white with grey-black apical spot, the hindwing is somewhat darker yellowish with ochre-yellow basal spot, grey-black apical spot, the hindwing is somewhat darker yellowish with ochre-yellow basal spot, grey-black and the extremities of the veins black. — boliviana Fruhst., from Bolivia, has the wings still more rounded than louisella, the apical spot less narrow and more strongly dentate, hindwing with scarcely perceptible black distal margin, ground-colour pure white, underside with light grey-brown apical spot, hindwing with narrow black marginal line and the extremities of the veins slightly tinged with black.

MATHANIA. By J. Röber.

D. polyhymnla *Fldr.* (= phaenna *Fruhst.*) (23 b), from Colombia, is lemon-yellow above with broad *polyhymnia.* If black margins, the discocellular of the forewing is slightly suffused with black, under surface deeper yellow with broader grey-black margins, in which are placed diffuse yellow spots, rather broad grey-black discocellular spot and similar costal margin of the forewing, as well as ochre-yellow basal spot on the hindwing.

D. isandra *Bde.* (23b), from Mexico, is impure white above with small grey-black distal-marginal *isandra.* 15°_{μ} markings on the forewing. Under surface of the hindwing light ochre-yellow with deep ochre-yellow basal spot, forewing somewhat lighter, in the posterior part almost white, with grey scaling on the discocellular; 2 light orange-yellow. — FRUBSTORFER has named the Honduras form kleta. Its 2 are above pale yellowish *kleta.* 35°_{μ} white, beneath either light canary- or ochre-yellow.

D. florinda *Btlr.* (= chiricana *Stgr.*) (23 b), from V<u>eragua</u> and Chiriqui, has somewhat darker yellow *florinda*. **359** ground-colour than *polyhymnia*, very narrow black apical and distal-marginal markings on the forewing and black marginal line on the hindwing. The under surface is deeper yellow with broader black distal margin on the forewing, in which yellow spots are placed, similar black marginal band on the hindwing and black discocellular on the forewing. The female has broader marginal markings and the hindwing ochre-yellow above and beneath. — monstrosa *Btlr.* (= panamensis *Stgr.*), from Veragua and Panama, has the upper monstrosa. **360** surface of the forewing white in the σ , in the φ the hindwing somewhat ochre-yellow. Larva according to H. RIBEE similar to that of *Gonepteryx rhamni*, lives on the calabash tree. — **anceps** *Stgr.*, from Chiriqui, *anceps.* **377** has in the σ only a yellowish tinge at the inner angle, the hindwing otherwise white, the φ has dull yellow hindwing. — **chagris** *Stgr.*, from San Juan on the Rio Chagres, has the forewing white beneath with yellow *chagris.* **362** costal margin, the φ has larger yellow spots in the black distal margin of the hindwing.

D. limbata Ky, from Ecuador. is white in the female, ash-grey at the base and the costal margin of the *timbata.* **363** forewing, the brown distal margin reaches to the anal angle, forewing with narrow ash-grey margin; under surface white, without spots, hindwing somewhat yellowish, club of the antenna spotted with yellow. σ unknown.

D. leucanthe *Fldr.*, from Ecuador and Colombia, differs from **inaequalis** *Bthr.*, from Bolivia and *leucanthe*. **Peru**, by its larger size. In *inaequalis* the distal margin of the forewing is straighter, the black apical margin *inaequalis*. **Jfg** narrower and proximally dentate, only the fringes (not the margin also) of the hindwing are blackish. σ above white, \mathfrak{P} glossy orange, at the costal margin and in the cell of the forewing canary-yellow, beneath the apical area of the forewing and the whole of the hindwing are ochre-yellow, the \mathfrak{P} is beneath saffron-yellow.

D. salacia *Godt.* (= vecticlusa *Ettr.*) (23 c, d), from Mexico, is above white with narrow black apical salacia. **366** margin on the forewing and similar marginal line on the hindwing, at the costal margin of the forewing is a subapical black spot, the markings of the under surface show through somewhat. The under surface of the hindwing is yellow with brown distal margin and a similarly coloured median band, which extends from the costal margin to beyond the 1. median vein, becoming gradually narrower, the forewing is white, with ochre-yellow basal area, a large subapical yellow spot which is bounded by the brown apical marking and proximally by a diffuse spot, and brown discocellular. The \mathcal{P} is of more compact shape, with paler ground-colour above and beneath and more developed brown markings (only known to me from figures). — **cubana** *cubana*.

D. idiotica *Btb*: (23 c) (locality unknown), for which BUTLER has erected the genus *Heliochroma* and *idiotica*. which is only known to me from the figure, probably belongs in this genus (not to *Hesperocharis*). Upper surface of the forewing lemon-yellow, of the hindwing orange-yellow, under surface likewise orange-yellow except tor the yellow posterior part of the forewing; no markings on the under surface of the hindwing except two small brownish spots at the costal margin; body blackish.

16. Genus: Mathania Oberth.

This genus differs sufficiently from *Pieris* and *Daptonoura* not only in the peculiar contour of the wings but also in neuration. The 2. subcostal vein does not arise as in *Daptonoura* at the upper angle of the cell, but far beyond it, not far from the apex; *Mathania* further differs from *Pieris* by the subcostal being only four-branched and by the precostal being curved proximad. The palpi are strikingly hairy. The butter-flies have mostly a leaf-like under surface. They appear to be purely inhabitants either of the high mountains or of districts in western South America with temperate climate.

M. leucothea Molina (= gayi Blanch.) (23b), from Chile, is the most like the Daptonoura-species. leucothea. ¹⁵ 36 The upper surface is pure white, the under surface yellowish white with more strongly yellowish apex to the forewing and more or less inconspicuous dark clouded markings on the hindwing. It is true this species does not altogether agree with the others in neuration and wing-contour, but unless a separate genus is erected it is probably best to place it in Mathania. It is possible that the name leucothea really covers two species; my material, however, is insufficient to settle this question.

HESPEROCHARIS. By J. Röber.

M. agasicles Hew. (23 b), from Bolivia and Peru, is above lemon-yellow with grey apex to the forewing, the underside of the hindwing and the apex of the forewing bear undulate grey-green lines, through the middle of the hindwing runs a distinct stripe (as in the Indian Helomoia-species), the costal margin of the hindwing is somewhat darker, the greater part of the forewing beneath is impure yellow and the veins are distinctly visible.

M. gaujoni Pouj. (= agasicles Hew?), from western Ecuador (Loja), is as large as esther, similar in shape to Dapt. idiotica, but the shape of the forewing more falcate, hindwing somewhat lengthened at the distal margin. Upper surface light lemon-yellow, apex of the forewing light brown-green. Under surface of the forewing as above, but paler, apex marbled with white-yellow. Under surface of the hindwing olivecoloured, anteriorly much darkened and marbled like the apex of the forewing; it has a transverse, yellowish olive longitudinal line. Between the three median veins are strongly darkened oblique lines, which give the hindwing the appearance of a leaf. Only known to me from the description.

M. aureomaculata Dogn. (23d), from western Ecuador (Loja), is similar to *gaujoni*, but the hindwing maculata. is rounded at the anal angle. Upper surface light lemon-yellow, the apex of the forewing olive-brown, very similar to that of gaujoni. Under surface of the forewing uniform lemon-yellow, the apex as above, but almost the whole of the cell is occupied by an orange-yellow spot, which extends along the costal margin and sends out rays between the adjacent veins. Under surface of the hindwing yellow, finely powdered with olive-coloured atoms, more strongly so at the costal margin. and four yellowish submarginal dots. - A or before me from North-East Peru (Huancabamba) answers to this description; another of from Hillapani is above very light yellow, almost white, also beneath much more whitish, the orange-yellow spot in the cell of the forewing somewhat smaller and the yellow interneural stripes are narrow pallida, the wing and altogether absent in the posterior part: pallida subsp. nov. (23 d). M. esther Oberth. (= aureomaculata Dogn.?) (23b), from Bolivia, is do particularly on the proximal part of the forewing, the apex of the forewing h of the forewing somewhat smaller and the yellow interneural stripes are narrower in the anterior part of

M. esther Oberth. (= aureomaculata Dogn.?) (23b), from Bolivia, is deeper yellow than agasicles, particularly on the proximal part of the forewing, the apex of the forewing has even less grey marking. The under surface of the hindwing is grey-greenish, darker at the costal margin, through the middle of the hindwing from the base to beyond the cell extends an indistinct yellowish stripe; between the median veins are placed four vellowish submarginal dots. The anterior proximal part of the forewing beneath is orangevellow, the rest light yellow ..

17. Genus: Hesperocharis H.-Schäff.

This genus is distributed from Mexico to South Brazil. They are plain white or yellowish insects with mostly small markings on the upper surface and characteristically modified lunate markings beneath. Of the four subcostal veins only the first branches off proximally to the discocellulars, the second nearer to the apex, the third and fourth branches form a short fork in the apex. Both radials run free, but the upper discocellular is very small. The costal margin of the hindwing is somewhat flexuose, the precostal curved proximad. The Hesperocharis are lively little insects, which fly in the most burning sunshine (between 10 and 1 o'clock), and therefore scarcely deserve their generic name.

H. antipator Druce. Upper surface of both wings pure white, hindwing very long. Under surface of the forewing white, base, veins and apex spotted with yellowish scales; hindwing yellowish white with dark veins. Nearly allied to leucania Bdv., but differing from it by the elongated hindwing, whiter colouring and complete absence of markings on the underside. Vera Paz. - Only known to me from the description. Jeucauia.

H. leucania Bdv. Shape as in ilaire (drusilla-or), wings rounder. Upper surface without spots, greenish white as Catopsilia florella and pyranthe. Under surface of the forewing of the same colour, distal margin broadly yellowish. Under surface of the hindwing anteriorly greenish yellow, in the middle more grey, but little prominent oblique, curved, flexuose markings at the distal margin, interrupted by the veins. Brazil. - Only known to me from the description.

H. catasticta spec. nov. (23e), from São Paulo, is superficially nearly allied to the Catasticta-species. Upper surface of the forewing pale sulphur-yellow, of the hindwing light ochre-yellow. The forewing has a rather broad black distal margin, in which small yellowish subapical spots are placed, and also a very irregular black spot on the discocellular and a black costal-marginal stripe, the hindwing has black triangular spots at the distal margin. Under surface of the hindwing yellowish white with black and yellow marginal spots, ground-colour of the hindwing white with black triangular distal-marginal spots, a submarginal lunate band of the same colour, a large indistinct black spot near the inner margin; in all the cellules there are placed yellow spots, at the base a red spot.

H. nera Hew. (23 e), from Ecuador and Bolivia, is above white, at the base of the hindwing yellowish and at the apex of the forewing grey-black. Under surface of the forewing white, apex paler grey than above and yellowish, ground-colour of the hindwing white with diffuse grey-blackish marginal, submarginal and median spots, as well as yellow streaks in the cellules of the hindwing and orange-yellow *boliviana*. basal spot. — The somewhat smaller **boliviana** *form. nov.*, from Bolivia, which has very weak markings

3 antipator.

catasticta.

Monera.

aureo-

78

agasicles.

gaujoni.

HESPEROCHARIS. By J. RÖBER.

beneath, appears to be a seasonal form. - nereis Fldr. (23 f), from Colombia, has the apical marking of nereis. the forewing above broken up into stripes and the under surface of the hindwing somewhat lighter -amazonica Fruhst, from the Upper Amazon, has broader black apical marking on the forewing and rather amazonica. broad black distal margin on the hindwing. The under surface is white with grey-black markings and sharp orange-yellow basal spot. - flavescens form. nov. (23 e) (aberration or seasonal form?) differs from it beneath flavescens. by a large light yellow spot in every cellule of the hindwing and yellowish stripes at the proximal part of the dark apex of the forewing. - nilios Fruhst., from the Rio Waupes, has a broader, dentate distal margin of nilios. the hindwing and also darker and broader markings on the hindwing beneath, by which it is distinguished from the less marked nymphaea Möschl., trom Surinam. — flaveola Fruhst, from Ecuador, is above and nymphaea. beneath a beautiful dark yellow, apex of the forewing beneath with obsolescent yellowish spots. — aphaia flaveola is the spots of the forewing beneath with obsolescent yellowish spots. Frukst., from the Rio Waupes, is a form of *nilios* with the upperside of the hindwing light yellow. — aida aphaia. 376 Frukst., from Peru, is smaller than the preceding forms and has the upper surface of the hindwing yellow. — Among it occurs minia Frukst. from Southarm Peru — Among it occurs minia Fruhst., from Southern Peru, probably as a dry-seasonal form. Upper surface minia. 577 white, hindwing without black distal margin. — nirvana Fruhst., from Bolivia, has the upper surface pure nirvana. 387 white with only moderately broad black apical spot, under surface almost pure white with completely diffuse black markings, only the apex of the forewing broadly suffused with light grey and a few remnants of black spots at the costal and distal margins of the hindwing, where also a few traces of the interneural stripes are preserved. To it belongs as a rainy-seasonal form vitha Fruhst, similar to amazonica, but the hindwing vitha. 390 with narrower black distal margin, otherwise entirely white, slightly suffused with ochre-colour at the base. Beneath at the apex of the forewing broadly grey-black with large whitish pointed spots, under surface of the hindwing with thick grey-black reticular marking and the apex of the cell broadly margined with grey; without orange-coloured interneural stripes.

H. costaricensis *Bates* (23 f), from Costa Rica and Chiriqui, is above white with very slight dark *costaricensis.* Markings at the apex of the forewing. Under surface of the hindwing and of the apex of the forewing dingy light yellow with indistinct dark markings, veins slightly dark, posterior part of the forewing white.

H. nereïna Hopff. (23 f), from Peru and Bolivia, is above yellowish white with blackish markings in nereïna. If the apex of the forewing and light yellow interneural stripes. The under surface of the forewing has yellow apex with dark markings and much more distinct yellow stripes; the latter are still more conspicuous on the hindwing and the hindwing has also blackish distal-marginal spots, a submarginal lunate line and black veins. — elea Fruhst., from Bolivia and Peru, has dark yellow ground-colour above and beneath. — phainia elea. If the stripes beneath, — In chloris form. nov., from Bolivia (Coroico), the upper surface is delicately greenish ditoris. If yellow white and the black apical marking of the forewing is broken up into separate small spots. The under surface is purer white and the dark and yellow markings less sharp:

H. anguitia Godt. (23 f), from South Brazil (Rio de Janeiro, São Paulo, Santa Catharina, Rio Grande anguitia. 39^{6} do Sul), is above white, sometimes (especially in the \mathfrak{P}) yellowish white and very little or scarcely at all marked with black at the apex and the distal margin of the forewing. The under surface of the hindwing and of the apex of the forewing is yellowish, the rest of the forewing white, on the hindwing and at the apex of the forewing blackish hook-shaped markings. Both the colouring and the markings of the under surface are somewhat variable. The \mathfrak{P} have rounder wings and mostly even less markings. Seasonal forms apear to occur, which, however, differ very little.

H. catogramma Koll., from Colombia, is allied to *anguitia*, larger; hindwing obtusely dentate, upper- catogramma. 34/ side white with a slightly yellowish tinge, distal margin and apex spotted with black; hindwing without spots. Under surface with pale saffron-yellow scaling on the forewing as above, only the spots are here changed to fine streaks, veins of the hindwing black, a zigzag line parallel to the distal margin. — Only known to me from the description.

H. erota Luc. (23 e) occurs in the same localities as *anguitia*. It is somewhat larger, with more mark-*erota*. *J4J* ings and has as characteristic mark a short, broad black streak, directed basad, on the under surface of the hindwing at the lower discocellular.

H. marchalii differs from the preceding species by its somewhat elongated and dentate hindwing; the distal margin of the forewing is also not smooth as in the other species. — marchalii Guér. (23 f), from marchalii. Colombia and Venezuela, is above slightly yellowish white with small, pointed marginal and submarginal black spots on the forewing and a black distal-marginal line on the hindwing, which is somewhat thickened at the ends of the veins. The under surface is marked quite similarly to the preceding species, but the black streak at the lower discocellular is absent. — coloë Fruhst, from Peru and Bolivia, has the under surface coloë. 400 pale sulphur-yellow and the hindwing more deeply dentate. — sulphurescens form. nov., from West Colom- sulphubia (Cauca Valley), has the upperside light sulphur-yellow and the underside somewhat deeper yellow. — rescens. 402 masonia Frukst, from Ecuador, has dark sulphur-yellow upper surface and "more pointed" (more elongated masonia. 413 posteriorly?) hindwing. Flies in April and again in October.

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LEUCIDIA; TERIAS. By J. Röber.

18. Genus: Leucidia Dbl.

This genus contains the smallest forms of Pierids and is confined to tropical America, for the statement that one species (impura Voll.) also occurs on Timor in the Indian Ocean is undoubtedly incorrect. The Leucidias have an extremely weak flight, for they fly so slowly that they can be caught with the hand in the air. The cause of this want of swiftness in flight lies probably (apart from the weakness of the body) in the form of the wings; the forewing is so very much rounded that it can hardly be said to have an apical angle. In structure this genus is more nearly allied with the superficially similar Pontia from India and Africa. The antennae are scaled along the whole length and gradually thickened to a small club. The subcostal is four-branched, the first branch arising far before the end of the cell and the second soon after it, the third and fourth branches form a short fork. The upper radial anastomoses to the half with the subcostal, consequently the upper discocellular is wanting. The hindwing has an almost straight costal margin, only very weakly emarginate, the simple precostal is curved proximally and the subcostal and upper radial have a common stalk. It is doubtful whether the forms erected as separate species are really independent or only forms of one or two species.

L. brephos Hbn. (= leucoma Bates?) (24 f), occurring from Venezuela to South Brazil (São Paulo), brephos. is white with a very slight yellowish tone, sometimes there is a fine blackish line at the anterior part of the forewing. The under surface is white.

L. pygmaea Trittw. (24 f), from Brazil (Rio de Janeiro, Sao Paulo, etc.), is above and beneath yelpygmaea. lowish white with narrow blackish distal margin on the upperside of the forewing.

L. exigua Prittur. (24t), from Venezuela and the Brazilian province of Rio de Janeiro (Corcovado exigua. and Leopoldina) is larger, yellow, and has a considerably broader black distal margin on the forewing, which extends to the inner angle.

elvina. L. elvina God^{*}. (= impura Voll.) (24 f), from Brazil (e. g. São Paulo), has slightly yellowish white upper surface and more strongly yellowish under surface, with rather broad black distal margin of the forewing above. My specimens of this species completely agree with the description and figures of *impura*, said to be indigenous to Timor.

19. Genus: Terias Swains.

This genus, which in the eastern hemisphere only extends a little beyond the tropics, occurs in America much further north, a few species advancing as far as the southern boundary of Canada. Though the Terias are mostly only small species, their richness both in species and individuals makes them quite a feature of the fauna. Their agility varies considerably; whilst the species with the apex of the forewing pointed (e. g. gundlachia) are good fliers, the round-winged species (e. g. albula) scarcely surpass Leucidia. With this genus begins the series of those Pierids which E. SCHATZ includes under the general name of "Dryads"; these are Pierids with the antennae short, strong, mostly without clubs, only gradually thickened towards the end and but rarely having a distinctly formed club. The species of Terias are mostly small, only exceptionally medium-sized, yellow or orange-coloured butterflies. The head is retracted; the eyes are naked and very little prominent, the palpi moderately long and laterally compressed, with large basal joint and small pointed terminal joint. The antennae are delicate, with gradually thickened, more or less distinct club. The subcostal is four-branched, with two branches before the end of the cell, the upper radial is partly coincident with the subcostal, consequently the upper discocellular is wanting. The hindwing is rounded or bears a short tail. On the position of the upper radial of the hindwing BUTLER has based the genera Sphaenogona (with ectriva Dbl, as type) and Pyrisitia (with proterpia F, as type). The origin of this vein is however rather variable; it either arises from the cell or at the origin of the subcostal or it has a common stalk with the latter. But as all sorts of transitions occur between these positions, the position of the upper radial is of no use as a generic character. — The larvae are slender, with short, soft hairs and mostly green. The pupae are somewhat curved, weakly compressed laterally, keeled on the dorsum, without lateral spines and narrowed to a point anteriorly. - The species of Terias prefer open situations with low shrubs and moist places, on which they often appear in large numbers, sometimes they congregate in great crowds, which often traverse long distances, even over the sea. They probably occur without exception in at least two generations, which are sometimes very different superficially, but the identity of the seasonal forms has only been proved in very few exotic species. Doubtless they have likewise developed local forms, but concerning this also very little is known with certainty. — A large number of Terias-species have been erected which very probably might be united with those dealt with below. In many cases mere individuals, and often also scarcely tenable local forms have been described as separate species. We cannot here go into the classification of all these unimportant forms, that would rather be a task for a monographic work on the genus. For the large African Region CHR, AURIVILLIUS only accepts eight species (including two doubtful ones). As in the following pages 43 species in 86 forms are dealt with, no principal form at any rate will be left unnoticed.

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TERIAS. By J. Röber.

T. gundlachia *Pocy* (24a), from Cuba, Mexico, Texas and Arizona, has the forewing rather sharply *gandlachia*. *V* pointed and the hindwing prolonged into a tail. Upper surface orange-yellow with sharp, broad costal margin and narrower and less sharp distal margin on the forewing. Under surface paler orange-yellow, on the hindwing with brownish spots and reddish yellow dusting.

T. longicauda *Bates* (24 a), from California, has the hindwing more pointed. The upper surface is *tongicauda*. If lighter orange-yellow and the black margin of the forewing is essentially different in form from that of *guadlachia*. The ground-colour of the under surface is somewhat lighter, but the marking does not differ from that of *guadlachia*.

T. proterpia F. (24 a), from the Antilles and the north of South America (Mexico to Venezuela), proterpia. ℓ 4 has the hindwing weakly angled and the forewing less pointed than in the preceding species. Upper surface somewhat darker orange-yellow than gundlachia, in the 2 more yellowish and the black apical markings somewhat broader. Under surface of the forewing light orange-yellow, of the hindwing yellow with small and indistinct macular marking.

T. nicippe Cr. (24a) occurs from New England to the northern part of Brazil and on the Antilles. nicippe. \downarrow 4 Ground-colour of the upper surface quite similar to that of proterpia, but nicippe is distinguished by the broad dark margins. The 2 has paler ground-colour, sometimes yellow specimens occur: ab. flava Holl.; flava. 41 the under surface is yellow, slightly sprinkled with brownish, on the hindwing with larger red-brown spots. Little is known of the first stages; the larva lives on Cassia and other Leguminosae. T. ECU.

T. mexicana Bdr. (= boisduvaliana Fldr.) (24 a), from Mexico, Arizona and Texas, is white above, mexicana. \checkmark sulphur-yellow on the anterior part of the hindwing, and has very broad, deeply sinuate black margins. The underside of the forewing is white with yellow margin, that of the hindwing sulphur-yellow with brownish markings in the centre and at the costal margin. — In **bogotana** *Fldr.*, from Colombia, the yellow colouring *bogotana*. \checkmark on the anterior part of the hindwing is wanting.

T. gratiosa *Ibl. & Hev.* (24b), from Venezuela (known to me from Honduras), has the upper surface gratiosa. Y a of the forewing sulphur-yellow, the hindwing white, and at the costal angle a large light orange-yellow spot and broad black-brown margins. The under surface is uniformly yellow with a small black spot at the discocellular and slight, indistinct brownish markings at the distal margin. — ingrata *Fldr.* (= gratiosa *Reak.*), ingrata. ✓ 4, from Mexico and Central America, has yellow upperside of the hindwing and still broader dark margins.

T. arbela Hbn. (24 b), from South Brazil, is above dark sulphur-yellow with rather broad black arbeta. 447 margin on the forewing and narrower margin on the hindwing; the latter varies somewhat, and is entirely wanting in the 2, which has also paler ground-colour. Under surface yellow with more or less developed red-brown marginal and central markings. - gaugamela Fldr., from Colombia and Mexico, has deeper gaugameta. 4 vellow ground-colour, broader and darker distal margin to the forewing and beneath more, but smaller redbrown spots. — boliviensis Stgr. i. l., from Bolivia, has a large light orange-yellow spot at the apex of the boliviensis. 4 hindwing and broader dentate distal margin of the latter; the 2 is paler and has more markings. - fabiola fabiola. 4 *Fldr.*, from Venezuela, has narrow black margins and the hindwing above is light orange-yellow and less pointed. -- chloë Fldr., from Colombia, has broader black margin to the forewing, the hindwing sharply duloe. 421 pointed but less suffused with orange-yellow. - damaris Fldr. (= mexicana Bdr., damarina Stgr.), from damaris. - 40 Mexico and Arizona, has deep yellow forewing and light orange-yellow hindwing, with sharply defined black distal margin on the hindwing. Under surface of the hindwing straw-yellow with large and small brownish spots. - pomponia Hopff., from Peru, is large, brilliant yellow, with strongly dentate black distal margin pomponia. 4 on the forewing and very narrow distal margin on the hindwing. - salome Fldr., from Ecuador, is very salome. -4 similar to pomponia, but smaller, and with the hindwing more strongly suffused with orange-yellow. - limo- limoneus. 42 neus Fldr., from Venezuela, is differentiated by longer wings, more acutely angled hindwing, lighter colour on the upperside, broader, more deeply incised distal margin of the forewing and narrower, shorter bordering of the hindwing. — theodes Fldr., from Venezuela, is probably only the φ of constantia. — Also theona theodes. 4*Fldr.*, described from a \mathcal{P} , appears to be only a somewhat aberrant female specimen. theona. 424

T. ectriva *Btlr.* Above very similar to *salome*, but the wings longer; forewing with broader dark *ectriva*. **420** brown distal margin, its irregularities less pronounced, angle of the hindwing less produced. Under surface similar to that of *constantia*. Ecuador (Archidona). — Is the type of BUTLER's genus *Sphaenogona*. Only known to me from the description.

T. sybaris *Hopff.*, from Peru (Chanchamayo), is very large, in the female sulphur-yellow, with broad *sybaris*. black distal margin on the forewing, which has proximally four excisions. Hindwing angled, at the costal margin whitish, at the apex spotted with black. Forewing beneath with a black stripe at the costal margin, apex reddish. Hindwing marbled with red-brown, at the apex a large red-brown patch of scales and extending from the cell a reddish stripe.

T. xanthochlora *Koll.* (24b), from Colombia and Chiriqui, has the hindwing only feebly angled. *xanthochlora*. Upper surface sulphur-yellow with black-brown distal margin on the forewing, on the hindwing in many

81

TERIAS. By J. Röber.

cases a black distal-marginal line. 2 much paler. Under surface uniformly yellow with slight brownish constantia, markings on the hindwing. - constantia Fidr., from Venezuela, is paler yellow in both sexes and has somewhat reduced black distal margin to the forewing. The under surface of the hindwing has larger and more reddish spots and the apex of the forewing margined with dark rose-red.

T. graduata Bthr. Forewing above saffron-yellow, base blackish, distal margin rather broadly and graduata. irregularly black, more than in *constantia*, but the irregularities less pronounced; hindwing on the abdominal half white, apical half saffron-yellow, at the apex gold-yellow; distal margin with distinct black border. Peru. — Only known to me from the description.

T. westwoodi Bdr. (24b), from Mexico, Costa Rica, Texas and Arizona, is above lemon-yellow, with westwoodi. orange-yellow tinge at the distal margin of the hindwing, or else entirely orange-yellow. The dark brown, dentate margin of the forewing is moderately broad, the border of the hindwing very narrow or only indicated. The under surface is yellow with slight orange-yellow tinge at the distal margin and two black dots at the discocellular of the hindwing; sometimes the hindwing shows slight, indistinct orange-yellow citring, markings. - citring Poey, from Cuba, is a small form with strongly orange-yellow colour at the distal

margin of the hindwing.

- T. reticulata Btlr. (24 b), from Peru, is a conspicuous species, one of the largest of the genus. The reticulata. upper surface is canary-yellow with black-brown apex to the forewing and small black dots at the distal margin of the hindwing at the extremities of the veins. The under surface of the forewing is somewhat paler than the upper, at the costal and distal margins somewhat darker, and with a black spot on the discocellular. The hindwing has dark yellow ground-colour and thick red-brown reticulate marking, also 6 marmorata. some large spots of the same colour. - marmorata Pouj., from Ecuador, has beneath less distinct reticulate markings.
 - doris. T. doris Stgr. i. l. (24b), from Bolivia, is perhaps only a gigantic form of the following species. It is vivid yellow above with broad black-brown apical markings. The under surface is likewise vivid yellow, with red apical margin on the forewing and some large red-brown spots on the hindwing.
- 431 T. deva Dbl. (24c), from South Brazil, Uruguay and Argentina, is above paler yellow than the deva. preceding species and has narrower apical marking. The less vivid yellow upper surface has on the hinddilensis. wing much more red-brown macular marking, - chilensis Blanch., from Chile, is smaller than deva and the apical spot is straight on the proximal side. It flies in two broods: in November and again February to 440 hahneli. April. The larva lives on Cassia. — hahneli Stgr., from the Upper Amazon, is somewhat larger than deva and the black marginal marking of the forewing extends almost to the inner angle.
- 441 leuce. T. leuce Bdv. (24 c), from South Brazil and Uruguay, differs from deva by the narrower but longer apical and distal-marginal marking of the forewing and the fuller yellow ground-colour. The under surface has no red-brown markings on the hindwing, but sometimes slight blackish ones.
- 1142 dina. T. dina Bdr. Upper surface beautiful chrome-yellow, orange at the margin of the hindwing. The forewing has a straight black distal margin, which extends to the inner angle and the costal margin. The hindwing has the black distal margin before the fringes more than usually narrow. Under surface of the forewing of a beautiful yellow with a small black median spot, under surface of the hindwing uniformly yellow with a blackish dot near the base, two small blackish median spots, then an oblique row of irregular brownish 44³ athalia. spots of scales. 9 somewhat larger, with broader margin. Cuba, common. - athalia Fldr., from Colombia.
- is larger, costal margin of the hindwing more convex. **T. calceolaria** Bilr. & Druce. σ^2 above deeper yellow than dina, black distal margin almost obsolete, 44 calceolaria. in the 2 the black apical area almost as in *dera*, triangular, hindwing with a golden yellow apical spot.
- Honduras. 5 hecabeoides. T. hecabeoides Mén. (24c), from Haiti, is so like the extraordinarily variable Indian hecabe L. that according to Méxérrie's figure scarcely any distinguishing characters can be found. Upper surface yellow with broad, deeply sinuate distal margin of the forewing and narrow black margin of the hindwing. Under surface vellow with blackish markings.
 - T. aesiope Mén. (24) has the forewing marked quite similarly to that of the preceding species, but aesiope. the hindwing instead of the black distal margin has only black dots, at the extremities of the veins. The yellow under surface shows irregular red-brown spots. - Haiti. Chu a

T. jaegeri Mén. (24c), from Haiti, is very similar to the Indian and Japanese laeta Bdv. Upper jaegeri. surface yellow with broad black apical and distal-marginal border, sharply cut off at the first median, under surface grey with darker markings, proximal part of the forewing yellow.

thymetus. T. thymetus F. (= perimede Prittur.) (24 c, d), from South Brazil (also recorded from Haiti), is above very similar to leuce, only somewhat lighter yellow, and has at the distal margin of the hindwing brownish spots, but is sharply distinguished by the style of marking of the underside. This is yellow with slight blackish markings in the middle of the hindwing and a large brownish spot at the apex of the forewing and at the distal margin of the hindwing.

82

TERIAS. By J. Röber.

T. stygma *Bdr.* (24d). Size and shape of *brigitta*. Upper surface lemon-yellow, the forewing with *stygma*. 444 a broad triangular black spot, which is somewhat produced at the costal margin and reaches to the inner angle. Under surface of the forewing yellow, with the band as above, but light rust-brown and slightly reddish. Under surface of the hindwing ochre-yellow, with two brown dots at the anterior margin of the cell, followed by a row of brown, interrupted zigzag markings, a large rust-brown spot at the outer angle as in *lisa*. but larger. Peru. — **stygmula** *Bdr.*, from Cuba, is very similar, but has smaller spots on the *stygmula*. 457 difference appears to be the sulphur-yellow colouring of the upper surface. Only known to me from the description.

T. neda Godt. (24 d). from Guiana, Venezuela and Nicaragua, is vivid lemon-yellow with black-brown neda. apical area to the forewing; at the distal margin of the hindwing are placed black dots. Under surface yellow with very slight blackish markings on the hindwing. — tenella Bdr., from Brazil (Bahia, Santa tenella. 45-3 Catharina. São Paulo), is above lighter yellow and has continuous narrow black distal margin on the hindwing. Also the underside is lighter yellow. — circumcincta Bates, from the Amazons, venustula Stgr., circumcincta. from Chiriqui, and nelphe Ftdr., from Mexico, as well as several other forms, differ so little that reliable venustula.

T. nise Cr. (24d), from Surinam and Dominica, is also very similar to *neda*, but has narrower black *nise*. 477 distal margin on both wings and extraordinarily light hindwing. The under surface is lighter yellow, the markings not different.

T. venusta Bdv. Similar to nise, but smaller, the margin of the forewing proximally less dentate, venusta. 490 border of the hindwing reduced to some black marginal dots. Under surface light yellowish on both wings and in both sexes, in the middle of the hindwing one or two small blackish dots as in nise and tenella, and a row of distinct, oblique brownish spots. Jamaica, Colombia,
 T. musa F. (= gentilis Bdv.). The same size as venusta, unper surface white, forewing, with a musa 459

T. musa F. (= gentilis Bdc.). The same size as *venusta*, upper surface white, forewing with a *musa*. broad black marginal band, slightly sinuate proximally, base dusted with grey. Hindwing with beautiful lemon-yellow margin, separated from the fringes, the latter white with small black spots. Under surface whitish, slightly yellow distally, base of the forewing lemon-yellow, in the middle of the hindwing two very small black dots. South America.

T. limbia *Fldr.* (24 d). from Venezuela, has vivid canary-yellow forewing and almost white hindwing, *limbia*. somewhat more strongly sulphur-yellow at the distal margin. The black-brown distal border of the forewing is rather broad, proximally dentate, the black distal border of the hindwing narrow. The under surface of the forewing is yellow, without markings, the under surface of the hindwing very light yellow, at the margins somewhat deeper yellow, with two black dots on the discocellulars. The \mathfrak{P} has the upperside pale sulphur-yellow, no dark distal margin to the hindwing, the underside yellower, with blackish macular marking on the hindwing.

T. lisa *Bdc.* d^c *Lec.* (= smilax *Godt.*) (24 d) occurs from New England to Honduras and has also been *lisa.* 460 found on the Antilles and Bermudas. The upper surface is vivid yellow with rather broad black-brown margins and a black dot at the discocellular of the forewing. The under surface is somewhat lighter yellow with reddish distal margin, a large reddish spot at the apex of the hindwing, two small black dots on the discocellulars of the hindwing. a similar one on those of the forewing and indistinct blackish spots on the hindwing. The 2 is paler yellow and has broader dark margins, which on the posterior part of the hindwing are broken up into spots, the under surface is darker yellow and somewhat more marked than in the σ . Although this species is very common in places (cnf. the note on migration in the Introduction) the earlier stages are still very insufficiently known. Larva green with two whitish stripes at each side, head yellowish. Pupa dark green, slender, breast prominent. The larva lives on Cassia and clover. — euterpe euterpe.

T. delia Cr. (= demoditas Hbn., daira Godt.) (24 d), from the Gulf States of North America, is above delia. 463 yellow with broad black apical marking and a broad black inner-marginal stripe on the forewing, as well as a large black spot at the apex of the hindwing. The under surface is sand-brown with the exception of the yellow proximal part of the forewing, the hindwing has slight dark macular markings. — lydia Fldr., lydia. 464 from Venezuala, has shorter, broader wings, the apex of the forewing more obtuse and the distal margin less arched, broader hindmargin, proximally more deeply convex, and considerably narrower proximal band on the forewing, the hindwing almost twice as broad.

T. jucunda Bdc. & Lec. (= ebriola Poey, albina Poey) (24 e), from the Gulf States of North America, *jucunda*. differs from *delia* in the longer marginal band of the hindwing and the lighter, grey to white under surface, almost without markings. — lemnia *Fldr.*, from Bahia, is distinguished not only by the broader border of *lemnia*. 466 the forewing, the larger apical spot of the hindwing which is joined to the other marginal spots, and the quite different under surface, which is glossy white, sparsely dusted with red-brown, but also in the greater length of both wings.

83

TERIAS. By J. Röber.

T. persistens *Btlr. & Druce.* Allied to *delia* and *eugenia*, upper surface yellow. costal margin and base broadly ash-grey, apex and distal margin broadly black-brown, a black-brown inner-marginal band distally bordered with gold-yellow: hindwing with black-brown apical spot, under surface as in *delia*. Honduras.

tyona. T. hyona Mén. (24e), from San Domingo, is beautiful orange-yellow in the male above with black margin, which is moderately broad on the forewing, narrow and sharply defined proximally on the hindwing. The ♀ has nuch paler upper surface. Beneath both sexes are almost alike; forewing in the middle orange-yellow, at the distal margin and in the basal part yellow, with a subapical row of small black spots, fringes reddish; hindwing yellow with some blackish dots near the base, some small red-brown spots at the apex, to which extends a narrow band of red-brown spots running towards the inner margin, and small, very indistinct red-brown submarginal spots.

pyro. T. pyro Godt. Shape and size as hyona. Upperside of the forewing vivid orange-yellow, slightly blackish at the base. Forewing with a black margin, proximally indented. Hindwing at the distal margin slightly dusted with blackish. Under surface of the forewing lighter than above, with a black dot in the middle and a dark apical spot. Under surface of the hindwing light yellow, with an orange-yellow central spot, some brownish scales and a very large round rust-brown spot at the apex, and also a row of small black marginal dots. Antilles or South America.

eleathea. **T. eleathea** Cr., from Surinam, is not essentially different from **plataea** Fldr. (24 e), from South plataea. Brazil (São Paulo, Santa Catharina. Rio Grande do Sul). The latter has yellow forewing and white hindeleathea. wing, broad margin on the forewing and narrower one on the hindwing, also a black stripe at the inner margin of the forewing, which is posteriorly edged with orange-yellow. The under surface is rather variable, whitish to grey, the anterior part of the forewing yellow, mostly only with black dots at the discocellular of both wings, not seldom with somewhat darker markings. The 2 has yellow or yellowish ground-colour on the hindwing above, the black and orange-yellow stripe at the inner margin of the forewing is absent. The under surface is mostly darker and more abundantly marked. This species also shows a number of vitellina. local forms, which have almost all been described as separate species, thus vitellina Fldr., from Venezuela and Honduras, with white-scaled inner-marginal stripe and the under surface entirely without markings; eugenia. eugenia Wall. (= rhodia Fldr.), from Venezuela, Colombia and St. Josef, with very dark yellow forewing cubana. and sharp and broader orange-yellow inner-marginal stripe; - cubana H.-Schöff., from Cuba, with broad palmyra black distal margin on the hindwing: — palmyra Poey (= lydia Fldr.), from Cuba and the Gulf States, in palmyra black distal margin of the hindwing is reduced to a spot at the apex; — phoenicia Fldr., from Cuba and the Gulf States, in Colombia and Flore because the hindwing is reduced to a spot at the apex; — phoenicia Fldr., from Cuba and the Gulf States for the spot of the Colombia and Ecuador, has orange-yellow inner-marginal stripe reaching to the base and rather broad distal elathides. margin on the hindwing; elathides Stgr., from Venezuela, is larger, and has no orange-yellow inner-marginal stripe: the \mathfrak{P} is darker beneath. — All these forms can scarcely be separated from one another. Considerably sidonia. different on the other hand are: sidonia Fldr., from Mexico, in which the black inner-marginal stripe is merged together with the black distal margin and the hindwing has very broad black distal margin: --44 etta. etta form. nov., from Ecuador, has no orange-yellow inner-marginal stripe, also the black inner-marginal stripe is merged together with the black distal margin and the hindwing has a broad black distal margin Wegea, which is sharply defined proximally. - tegea Fldr., from Colombia, is larger than *vitellina*, with broader wings, and may be recognised by the greater width of the inner-marginal band of the forewing and the medutina. distal-marginal one of the hindwing. - medutina Fldr., from Venezuela, has narrower wings, the forewing is more elongated and the hindwing shorter. w priddyi,

i. **T. priddyi** *Lathy.* from Haiti, differs from *eleathea* in the yellow upper surface of the hindwing, the shorter dark distal-marginal band of the forewing and the absence of the yellow stripe at the inner margin of the forewing and of the dark distal margin of the hindwing, which is only represented by marginal spots.

mycale. **T. mycale** *Fldr.* (24 e), from Brazil (Bahia, São Paulo), is very similar to *eleathea*. The dark distal margin of the forewing is broader and confluent with the hindmarginal stripe, also the distal margin of the hindwing is much broader. The under surface of the forewing is less yellow, otherwise not different.

T. smilacina Fldr., from Colombia, was described from a \mathcal{P} . Upperside pale sulphur-yellow with blackbrown distal margin, hindwing with black marginal dots. Underside glossy white, at the discocellular a crescentshaped spot, a subapical red-brown macular band, a black dot at the costal margin near the apex of the forewing; hindwing with spots at the discocellular, a subapical macular band and black marginal dots.

abula. T. albula Cr., from Surinam, probably scarcely differs essentially from marginella Fldr. (24 e), from marginella. Venezuela. This is white above and has moderately broad black margin on both wings. The under surface is white, entirely without markings. — sinoë Godl. (= cassiae Sepp, nise Hbn.), from South Brazil, has more or less broad distal margin on the forewing and entirely white wings. The under surface is white or sometimes yellowish. The \mathcal{P} has narrower and shorter distal margin on the forewing and some dark markings on the hindwing beneath.

deflorata. T. deflorata Koll., from Colombia, is similar to albula. Upper surface white, forewing with a yellowish tinge, apex black, irregularly defined proximally, at the distal margin of the hindwing three to four blackish

84

persistens.

smilacina.

CATOPSILIA. By J. Röber.

streaks. Under surface of the forewing at the base lemon-yellow, at the apex slightly dusted with redbrownish. The hindwing has a scarcely perceptible yellow tinge and before the distal margin a stripe composed of brownish atoms, which, however, is not at all conspicuous. Only known to me from the description.

489 T. agave Cr. (= jodutta Hbn., phiale Godt., mana Bdv.) (24f), from Surinam, has the forewing much agave. rounded and very narrow. Upper surface white with black markings at the apex and blackish dusting at the base of the forewing. Under surface white on the proximal part of both wings, otherwise yellow, with a black dot at the discocellular of the hindwing and slight blackish markings on the hindwing.

T. messalina F. Shape and size as rahel. Upper surface white, distal margin of the forewing and messalina 490 a marginal spot on the hindwing black. Under surface yellow, with a brown spot at the apex of the forewing, a marginal spot and black scales on the hindwing. - Jamaica.

T. gnathene Bdr. Shape and size of albula. Upper surface white with a very slight greenish tinge, gnathene. 441 black distal margin, which is rather strongly widened at the apex and terminates in the anal angle of the hindwing. Under surface of the forewing white, at the base and apex lemon-yellow, a longitudinal row of reddish spots at the inner margin, a blackish spot at the apex, a violet subapical spot. Under surface of the hindwing vellowish, with a small, light rust-brown lunular spot at the margin of the cell, a deep rustbrown and a deep red-brown spot (less sharply defined) at its posterior margin. - Yucatan and Cuba.

T. phiale Cr. (24f), from the eastern part of tropical South America, is white with black margin to phiate. 492 the forewing and narrow black distal margin to the hindwing, before which is placed a light vellow band. The under surface is light yellow and almost without markings except for two black dots at the discocellular of the hindwing. - columbia Fldr. (= phialina Stgr. i. l.), from Colombia and Bolivia, has somewhat columbia. 49 narrower distal margin on the forewing, proximally almost rectilinear, and the black distal margin of the hindwing less developed. - Whether paula form. nor., from São Paulo, is a separate species or a form paula 494 (perhaps a seasonal form) of phiale, I cannot say from the two male specimens before me. The black distal margin of the forewing only reaches to the first median vein, that of the hindwing is broken up into small dots and the under surface of the hindwing is dark yellow. Has two conspicuous black dots at the disco-cellular and copious grey-brown macular marking. The apex of the forewing is likewise dark yellow.

Pi udi:

20, Genus: Catopsilia IIbn.

This genus has about the same range as Terias. In the mountains no species appears to ascend beyond 2000 m. The species which belong here are mostly of considerable size and fine, sometimes conspicuous, colouring. The powerfully built body and the shape of the wings make the insects particularly adapted for swift flight. They use this capacity for distant migrations, in which extraordinarily large crowds sometimes participate, their passage often lasting for hours. Apart from this the common species occur in large swarms, enliven the damp banks of the rivers and contribute materially to the character of the fauna of their district. The Catopsilia-G'd' are not only immoderate water-drinkers, but are also attracted by human sweat and urine, as Dr. FR. OHAUS proved during his travels in South America. He also observed swarms of Catopsilia on the stranded bodies of fishes. The \$\$\$ mostly remain in the woods and visit flowers, on which of course $\sigma \sigma$ are also to be met with when they seek the company of the \mathfrak{R} . — The rather large head has prominent naked eves, the palpi only project a little beyond the head, the antennae are short and moderately soft, without distinct club, with truncate or indented tip. Subcostal four-branched, the first branch beyond half way between the base and the discocellular, the second branch arising shortly before the discocellular, the fourth branch running into the distal margin, the upper radial coincident with the subcostal to ¹/₄, the middle discocellular shorter than the proximally curved lower one. Hindwing rounded, in some species prolonged into a tail at the submedian. The precostal is a mere knob. The larvae have the usual Pierid shape and granulated skin, are grey or green and have a light lateral longitudinal stripe; they live on Cassia. The pupae are rather variously shaped; as far as they are known they will be described under the respective species. - Contrary to the usual custom I refer (with A. G. BUTLER) menippe to the following genus, from which it only differs in neuration by an unimportant deviation, whilst in its other characters menippe agrees with Gonepteryx. — This genus contains some species which in beauty must be considered as the climax of development among the Pierids.

C. eubule L. (= marcellina (r.) (25 a) occurs from New England to Argentina, also on the Antilles. eubule. Upper surface in the σ lemon-vellow, lighter at the distal margins, and with black marginal line. Beneath somewhat paler yellow with a silvery "eight", edged with red-brown, on each wing at the discocellular, a black marginal line and irregular dark markings on both wings. The \mathcal{P} is somewhat paler yellow, has a row of marginal spots on both wings, a large black median spot on the forewing and sometimes more or less dark brown marking. The under surface is deeper yellow and more marked than in the c². - sennae L. sennae. 496 = yamana *Reak.*) is beneath deeper yellow and more abundantly marked, the φ being pale orange-vellow

-4.93

CATOPSILIA. By J. Röber.

drya, above. drya F. (= amphitrite Blanch.), from Peru, Chile, Cuba and Haiti, is a small, weakly marked - eubule flies in June and again from September to October, drya in November to December and form. from March to April. The or has as scent-organ on the upper surface of the hindwing near the costal margin a spot of scales, over which the soft, widened inner margin of the forewing is stretched out to stir up the scent, scattering it with a pencil (retractile into a fold in the skin).

C. cipris F. (= bracteolata Btlr.) (25c), from Brazil and Peru, has the hindwing prolonged into a civris. tail in both sexes. The c^2 is very light orange-yellow, the broad distal margin of the forewing, which is thickly covered with chalky scent-scales, and the considerably narrower distal margin of the hindwing lighter; the upper surface has no markings except small marginal spots on the forewing. The under surface is darker yellow with a silvery eight on both wings and more or less dark markings. The underside is very variable. The \mathfrak{P} is lemon-yellow and has a large black median spot on the forewing, the under surface neocypris. is more greenish than in the J. - neocypris Hbn., from the same localities, is in both sexes suffused with 500 irrigata. orange-yellow above at the margins and is also darker beneath. Probably a seasonal form. - irrigata Bthr., n, virgo from Brazil, is an aberrant female form, more strongly marked above and beneath. - virgo Bilr., from Central America, is more strongly marked, has black marginal spots in both sexes, also in the σ a large black median spot on the forewing, and the $\hat{\gamma}$ is white above with narrow red distal margin.

50% rurina. C. rurina Fldr. (25b), from Venezuela, Colombia, Ecuador and Peru, occurs apparently only at elevations of 1000 to 2000 m. The forewing in the σ is orange-yellow except for the distal margin of lemon-yellow scent-scales which occupies almost half the wing, the hindwing lemon-yellow with broad, light orange-yellow distal margin, at the distal margin of both wings are placed small black-brown spots. The under surface is yellow with a silvery double spot at the discocellular of each wing and more or less blackbrown markings. The \mathfrak{P} is very variable, from bright yellow to almost white ground-colour. stronger distalmarginal markings and a large black-brown median spot on the forewing and also large red distal-marginal spots or broad red distal margin on the hindwing. The under surface has paler ground-colour and more Vintermedia. red-brown markings, often united into large spots. - intermedia Btlr. is the Central American form; the orange-yellow colour of the forewing of the σ is almost entirely absent and the φ has whitish ground-colour.

philea. **C.** philea L. (= argante Hbn., corday Hbn., aricye Cr., melanippe Cr., lollia et aricia Godt.) (25 c), distributed from Texas to South Brazil, very common in some places, also observed in Illinois as a migrant, is one of the most beautiful species of this genus. The upper surface in the σ^2 is a fine canary-yellow with a large orange-yellow median spot on the forewing and broad orange-yellow distal margin on the hindwing. The under surface is pale yellow with silvery median double spot and brownish markings. The secondary male characters consist of a spot of scent-scales on the upperside of the hindwing, to which corresponds a pencil found on the underside of the inner margin of the forewing, and a moderately broad band of scentscales on the upperside of both wings, only slightly contrasting in colour. The 2 is less brilliant yellow, the large orange-yellow median spot of the forewing is absent, but it has a large black-brown median spot and marginal, submarginal and costal macular markings on the forewing, as well as dark marginal spots on the hindwing. The ground-colour of the under surface is redder than in the σ . — thalestris III. (= huebthalestris neri Fruhst.), from the Antilles, also reported from Chile (?), has in the 3ⁿ a larger orange-yellow median spot, also a large black-brown spot at the discocellular of the forewing. The under surface is much more marked and shows at the distal margin of the hindwing large red-brown spots. The 2 has much more red above and beneath and is much more strongly marked, especially on the under surface, which shows on the hindwing a broad red-brown distal margin and a large median spot of the same colour. - Pupa regularly canoe-shaped, dorsum strongly incurved, head prolonged into a long point.

C. avellaneda H.-Sch. (25d), from Cuba, is unquestionably the most beautiful species of the genus. In the σ^2 the ground-colour of the upper surface of the forewing is canary-vellow, a broad margin ochre-yellow, the distal margin narrowly red, the central and posterior part of the wing is gorgeous carmine, at the discocellular is placed a red spot with black centre. The hindwing is less fiery carmine, in the cell yellowish red, the long spot of scent-scales placed at the subcostal is white, the distal margin rather broadly ochre-yellow. The under surface is red-yellow with white double spot in the centre of each wing and continuous black-brown submarginal spots. The 2 has the upperside of the forewing canary-yellow with red distal margin and marginal and submarginal red-brown spots as well as a large red-brown spot at the discocellular, the basal part of the wing is sprinkled with red. The hindwing is yellowish red, at the costal margin light pink, with marginal and submarginal red-brown spots. The under surface has dark yellow ground-colour, the broad distal-marginal band is blue-red with red scales, the margin itself narrowly yellow; the broad blue-red distal margin is proximally bordered by black crescent-shaped spots and at these as well as at the base there is dark red colouring, at the discocellular of each wing are placed white, blacksolstitia. edged spots (five on the forewing. two on the hindwing). - solstitia Bthr. (25 d), said to be from Chile, but probably an aberrant form of *avellaneda* and therefore also indigenous to Cuba, is differentiated from the latter by a narrower and proximally rectilinear ochre-vellow distal margin on the upper surface and by the

avellaneda.

CATOPSILIA. By J. Röber.

carmine spots of the forewing being reduced proximally. On the supposition that the locality "Chile" is correct, BUTLER regards *solstitia* as a separate species on account of a few small differences in the hairs of the body.

C. editha Bdr. (26 a), from Haiti, is in the σ' lemon-yellow without markings, the under surface *editha*. So β' is dark yellow with two white spots, surrounded with black-brown, at the discocellular of the hindwing and also small black-brown macular markings. The $\hat{\gamma}$ has the upper surface reddish yellow, especially on the hindwing, with a large black median spot and marginal and submarginal black-brown spots on the forewing, and also small black-brown marginal spots on the hindwing, the under surface is scarcely different from that of the σ' . — fornax Bdr., from Chile (?), I regard as a $\hat{\gamma}$ -form of *editha*. The upper surface has much more *fornax*. If δ' which is yellow, has many more red markings.

C. argante F. (= larra F., cnidia Godt.) (25 a) is distributed from the North American Gulf States argante, 50 to Paraguay and very common. The σ^2 is above pale orange-yellow and without markings except the black marginal spots. The rather narrow margin of scent-scales is little conspicuous, this species like several others has a further scent-organ. consisting of a spot of scales on the upperside of the hindwing, which is associated with a pencil on the underside of the inner margin of the forewing for scattering the scent. The under surface is yellow with numerous brownish markings and sometimes white spots at the discocellular. The $\hat{\varphi}$ has similar ground-colour on the upperside, but more black marginal markings, also a black median spot on the forewing. The under surface is more strongly marked with dark. The pupa has extraordinarily swollen breast. the head is produced into a point, on the thorax is an acutely angled elevation and along the sides runs a ridge-like protuberance. — hersilia Cr is a more strongly marked form. The σ has in-*hersilia*, stead of the red marginal spots of the forewing a narrow black marginal band and the \mathfrak{P} has more and larger black spots. The under surface is also more marked. — rorata *Btlr.*, from Haiti, is a large form. rorata. $\sqrt{312}$ The σ has unusually bright yellow marginal band and the φ with almost white ground-colour has much black macular marking as well as red striation on the upper surface. Also the under surface shows in the 2 red-brown spots united into bands. — minuscula Bthr, said to be from Havanna, but which I have from minuscula $\delta largende$ and $\delta largende largende$ (argantr?), Panama, Venezuela, Haiti and Brazil, would have to be regarded as a separate species according to BUTLER's figure of the pupa. But BUTLER is in error; he has figured the pupa of philea, as I have positive proof. The butterfly is similar to *argante* in the σ^2 , but has a strongly marked light distal margin of unequal width on the hindwing and the posterior part of the wing is yellow. The under surface shows besides other markings on the forewing a red-brown macular band running from the apex towards the inner margin. The $\hat{\gamma}$ is above reddish yellow, with a large orange-yellow patch at the discocellular of the forewing, in which the black median spot is placed. The under surface is similar to that of the σ , but more strongly marked. - floridensis Neumögen i. 1., from Florida, is in the male entirely without markings above, storidensis, 513 the margin little lighter than the proximal part of the wing, beneath on the contrary rather strongly marked, the band of red-brown spots running from the apex of the forewing towards the inner margin being particularly striking. The φ is above almost as uniform as the σ , only somewhat lighter orange-vellow colour, and has no markings at all except slight brownish ones at and near the apex of the forewing and the very indistinct small dark median spot on this wing.

C. trite L. (25 b), from tropical America, has yellow upper surface with black distal margin on the *trite*. If forewing, which in the $\hat{\gamma}$ is somewhat broader. The margin of scent-scales is very narrow and inconspicuous, the scent-apparatus on the proximal part of the wing is as in the preceding species. The under surface is greenish yellow, lighter at the margin, and has besides slight submarginal markings on the hindwing an oblique blackish band, peculiar to this species, on both wings. The $\hat{\gamma}$ has lighter ground-colour beneath.

C. statira Cr. (26 c) occurs very commonly in the whole of South America. The distal half of the statira. 57, wing is covered with scent-scales and is strikingly lighter than the lemon-yellow proximal half. The upperside has no markings except a narrow black distal margin. The 2 has broader black distal margin and also a black median spot on the forewing. The under surface has slight dark markings. — wallacei Fldr., from wallacei. 511Rio Negro and Peru, is uniformly yellow above and has the distal half of the wing very light beneath.

C. boisduvalii *Fldr.* (26 c), from Colombia and Central America, is cream-coloured, more strongly *boisduvatii.* **flg** yellow on the basal part, with narrow black apical margin. The under surface is light yellow, entirely without markings.

C jada *Bth*. (26 b), from Guatemala, has in the σ^2 the proximal half of the wings ochre-yellow, the *jada*. $\sqrt{520}$ distal half lemon-yellow, no markings, the under surface is reddish yellow, lighter on the distal half. The \Im is above yellow with black dentate distal margin and round black median spot as well as a subapical row of four small ochre-yellow spots. The under surface is bluish white with reddish marginal and medial markings. — jaresia *Bthr.*, from Peru, is only known in the female. Like the *argunte*- \Im it is orange-yellow *jaresia*. 521

GONEPTERYX. By J. Röber.

with black median spot, but has on both wings continuous black marginal markings. The under surface is somewhat more reddish vellow than in *jada*, the markings almost the same.

godartiana. C. godartiana Swains. (= orbis Bdr.) (26b), from Haiti and Porto Rico, has half the upper surface of the forewing white and the other half yellow; the white distal half has a narrow yellow margin. The proximal part of the hindwing is reddish yellow, shading into greenish distally, a broad margin is white. The under surface of the forewing is in the anterior part yellowish with dark submarginal markings, in the posterior part whitish. The proximal part of the hindwing beneath is reddish white, the margins are greenish, the distal margin broadly so; there are no markings except two white spots at the discocellular and a few small blackish submarginal markings. The 2 has dingy reddish yellow upper surface with continuous black marginal markings, large black median spot and a small hook-shaped submarginal spot on the forewing. The hindwing has larger disconnected black marginal spots. The under surface is reddish yellow in the proximal part, in the distal part almost white with reddish marginal markings, blackish submarginal markings, large reddish median spot on the forewing and two white, brownish-edged median spots on the hindwing. neteis. neteis Bdv., from Cuba, Mexico and Guatemala, has the distal part of the upper surface less strikingly white and there are no markings on the under surface, which is yellowish on the proximal half and whitish on the distal half. The 2 is above much lighter, more yellowish and with less black markings, the groundbutteri, colour of the under surface lighter. — butleri Scudd., from Mexico (Tehuantepec), is apparently only an aberrant female with light chamois-coloured upper surface and the markings somewhat more brown-black. -Martonia. hartonia Bthr., from Jamaica, is in the or above very similar to godartiana, only the greenish tinge is wanting; the under surface is quite similar to that of *neleis*, but has somewhat dark markings. The φ is similar to the neleis-2, but has no continuous marginal markings on the forewing above. On the under surface the forewing is more yellowish, the hindwing more reddish, also less marked.

db orbis. C. orbis Poey (26 a) from Haiti and Cuba, is very peculiarly marked in the of above. The orangeyellow colouring, which is spread over the whole upper surface in the 2, is only present in the σ in a large circular spot near the base. The distal half of the forewing is white, the rest of the wing yellow. The hindwing is yellow, with broad white distal margin. The underside is reddish yellow with a white, reddish bordered median spot on each wing, reddish marginal line and red-brown submarginal markings. The \mathfrak{P} is entirely orange-yellow above and has black marginal and submarginal spots and also a square black median spot. The under surface is more strongly marked with red-brown than in the or. The pupa is comparatively slender, without anything striking in its form, the head-part produced into a short point. Larva on Poinciana pulcherrima, green with yellow venter, all the incisions light greenish vellow. Pupa green, canoe-shaped, extremities pink and veins vellow (BOISDUVAL).

21. Genus: Gonepteryx Leach.

The few species of this genus would be better united under the generic name of Amynthia Swains., since they not only differ from Gonepteryx-species of the Old World by their gigantic size, but also possess structural characters which well separate them from Gonepteryx. The fourth subcostal vein does not run into the costal margin, as in true Gonepteryx, but into the much more produced apex. According to E. REUTER the American species agree in the structure of the basal joint of the palpi, but differ in this from the true Gonepteryx-species. The species which belong here cannot be mistaken on account of their wing-contour, and possess a further common characteristic in that the subcostal of the hindwing appears especially developed on the under surface and is particularly conspicuous by its peculiar colouring. The secondary male characters agree with Catopsilia, but are even more developed, the greater part of the wing above being covered with chalky scent-scales, whilst the scent-organ at the costal margin of the hindwing takes the form of a long, broad gland. One species is distributed from Paraguay, the other two have a more restricted range. -Nothing appears to be yet known as to the earlier stages.

menippe.

G. menippe *Hbn.* (= leachiana *Godt.*) $(2\hat{q}g)$ apparently occurs in the whole of tropical America, not even shunning the higher mountains. It surpasses the most conspicuous Indian Pierid, Hebomoia glaucippe, both in size and in beauty. The upper surface is light vellow, sometimes somewhat darker, the apical third of the forewing is gorgeous orange-vellow. at the discocellular is placed a large, square brown-red spot, before it sometimes also a smaller, but otherwise similar spot. The blackbrown distal margin varies very much in width; in most specimens it is as shown in our figure, not infrequently it is reduced to marginal spots which are only connected by a marginal line, occasionally alypso. it is entirely absent: ab. calypso form. nov. The hindwing has only rarely blackish marginal spots. The ground-colour of the under surface is likewise rather variable, from greenish white to yellow, with more or less sharp, light, somewhat opalescent markings; there are always on both wings an oblong, much interrupted reddish median spot and a more or less complete row of black submarginal dots; the sub-

88

KRICOGONIA; TERIOCOLIAS. By J. Röber.

costal of the hindwing is conspicuous by its colouring. The Q differs in the orange-yellow spot being somewhat lighter and has also more blackish spots at the distal margin of the hindwing. Specimens in which the orangevellow spot is entirely absent are rare: ab. thetis form. nov. — FRUHSTORFER has based the subspecies metioche lhelis. on 2 specimens from Colombia; it is said to be characterised by darker, deeper and more uniform yellow groundcolour, longer and narrower wings, larger size, larger, lighter and more divided median spots on the under surface.

6. clorinde Godt. (= swainsonia Swains., godarti Perty, maerula Hbn.) (24g) is distributed from Mexico clorinde. 31 to Paraguay, extremely variable in size, has the upper surface white with a faint greenish tinge, the large median spot is either orange- or sulphur-yellow, on each wing is a small black median spot margined with red-yellow. The under surface is greenish with white striation and an inconspicuous reddish median spot on each wing. The \mathcal{Q} differs in having the yellow median spot much less developed and the median spots larger and much more broadly surrounded with red-yellow. - nivifera Fruhst., from Central America, is said to be distinguished nivifera. by snow-white upper surface, darker, more orange-yellow median spots and yellowish-marbled under surface.

G. maerula F. (24g) is distributed from Mexico to South Peru, but appears to be wanting in the east maerula. of the district. The upper surface is lemon-vellow and has no markings except the black-brown median spot and perhaps a few black marginal dots. The scent-organ on the hindwing is lighter. The under surface is greenish with light striation and a white, reddish-bordered median spot on each wing; the subcostal of the hindwing is distinctly prominent. The \$\$ are mostly whitish and have a larger orange-yellow median spot on the hindwing. A canary-yellow Q-form is more rare: ab. flava form. nov. — To lacordairei Bdv. (= ecclipsis Cr.) belong flava. those specimens which have a plain yellow under surface without striation. — gueneeana Bdr is still loca diffusion diffusion. ferent; specimens with distinct black marginal spots should be referred here.

22. Genus: Kricogonia Reak.

This genus has its area of distribution from southern North America to Venezuela and also occurs on the Antilles. Apart from the much smaller size and the shape of the wings the only difference from Gonepteryx is that the long palpi extend far beyond the head. There is no difference in the neuration. The early stages are still unknown.

K. lyside Godt. occurs from Texas and California to Venezuela. The upper surface is white, the proximal lyside. 53/ part of the hindwing suffused with yellowish, the basal part of both wings yellow, the under surface slightly yellow except for the almost white posterior part of the forewing, with no markings, only occasionally a black median spot on the hindwing. The φ has less yellow at the base and the apex of the forewing is darker. terissa Luc. (= lyside Hbn.) is an aberration which is distinguished by a small black stripe at the costal margin terissa. 539 of the hindwing. — xanthophila form. nov. (26d), from Guatemala, is an entirely yellow form (only in the fe-xanthophila 13, male?). The underside of the hindwing is light, contrasting with the forewing. — castalia F. is the form from castalia. 540 Jamaica. It has at the base only traces of yellow, and the under surface, especially of the forewing, is even less vellow.

K. fantasia Btlr. (26d), from Nicaragua, has in the female greenish white upper surface, at the costal fantasia. 54 margin of the forewing a dark sulphur-yellow basal stripe and light brown apical and distal-marginal markings, the hindwing is light sulphur-yellow. The underside of the forewing is glossy sulphur-yellow on the basal half, the rest of the wing is light sulphur-yellow, hindwing as above, in the basal half darker sulphur-yellow. Is probably only another aberration of lyside; a quite similar specimen from Cuba is before me.

23. Genus: Teriocolias Röb.

It is not practicable to allow atinas Hew. to remain in the genus Terias as it is much less closely allied to this than to Colias. It differs from the latter in that the fourth subcostal vein does not run into the distal margin but direct into the apex and that the lower discocellular of the forewing is wanting; the lower radial arises direct from the subcostal. A fourth peculiarity of this genus is the clothing of the basal half of the antennae with long, hair-like, moderately appressed scales, so that the antenna when only a little magnified gives the impression of a Heterocerous antenna. Similar structures occur among the Erycinids, and also in the American Gonepteryx and Catopsilia, but not, so far as I can ascertain, in Terias. Biological reasons are also against its near relationship to Terias: that is to say, atinas flies in the high mountains, where species of Terias never occur.

T. atinas Hew. (26d), from Bolivia, is above deep sulphur-yellow with a small black spot at the disco- atinas. cellulars of the forewing, the basal part of both wings is black, at the distal and costal margin of the forewing near the apex are placed small dark spots or dots. The under surface of the forewing is sulphur-yellow with reddish distal margin and small dark marginal spots as well as two black dots at the discocellulars, the under

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89

COLIAS. By J. Röber.

surface of the hindwing is yellow, densely dusted with brownish and with red-brown spots at the costal margin pacis. and in the middle and two blackish dots at the discocellulars. The φ has lighter ground-colour. – pacis Stgr. i. l. (26d), from Peru (3300 m), is above somewhat deeper yellow, beneath the reddish border of the forewing plesseni, is broader and the hindwing is more deeply dusted with red-brown. - plesseni subsp. nov., from Chanchamayo (Peru), was captured by Baron G. VON PLESSEN on March 26 1906 on the way from Aroya to La Merced on the eastern slopes of the Andes, where the species was flying together with Colias euxanthe over lupine-fields. It is above and beneath sulphur-yellow, has beneath no differently coloured border to the forewing and shows only a little blackish dusting on the sulphur-yellow ground-colour apart from the blackish brown spots of the hindwing.

24. Genus: Colias F.

About three-fourths as many species must be referred to the American Region as to the Palaearctic if the conception of species is not applied too critically. But on a more thorough examination scarcely more than twenty American species can be established, hence about half the number which the Palaearctic Region produces. Considering the enormous size of the region this suggests an apparent poverty in species in America, which however is explained when we remember that the species of Colias are in great part inhabitants of the mountains, and the American Region properly shows only one mountain range, although an enormous one. The splitting up of Central Asia into a number of independent mountain ranges has apparently been very favourable to the formation of Colias-species. This advantage is wanting in the American Region. On the other hand it must further be taken into consideration that the most southern part of America possesses a few species, some of them very conspicuous, for which the eastern hemisphere can offer no equivalent owing to the want of corresponding lands.

The genus Colias is unmistakeably characterised by its superficial appearance; whether the species comes from the far north or the extreme south it is immediately recognised as a Colias. In neuration its special characteristic is the entire absence of the precostal, in which the genus agrees only with the superficially very different Terias. The butterflies are mostly of medium size, some species are among the larger Lepidoptera. Antenna rather short, with gradually thickened, but distinct club. Apex of the forewing rounded, forewing with four subcostal veins, of which the first arises far before the discocellular; the upper radial arises from the subcostal, hence the upper discocellular is wanting.

The genus has its principal area of distribution in Central Asia, where most of the species have their habitat. It is almost exclusively confined to districts with a temperate climate. In North America, in the mountains of tropical South America and in the plains of the southern part of South America, as already said, a large number occur, in Africa only two species (local forms of Palaearctic species), but in the Indo-Australian Region, except in the Himalayas and the Nilghiri Hills, no species occurs. A few species extend far towards the north (e. g., C. boothii to lat. 75%), and in Tierra del Fuego occurs one of the largest and most beautiful species (imperialis). A few species occur in two generations, but most in only one. Sexual dimorphism is well developed in most of the species, also dimorphism in the \Im , which often occur in a pale and in a bright yellow or orange-coloured form. Their flight is very quick and long-sustained. The 33 of many species possess as secondary sexual character at the costal margin of the hindwing above a more or less sharply defined small disc of thick chalky scales ("Mehlfleck"). - Egg cylindrical, feebly ribbed. Larvae long, of almost equal width throughout, with very short hairs; they hibernate, live mostly on clover and allied plants, the species indigenous to the north mostly on Vaccinium. Pupa with pointed head and raised, very sharp dorsal side of the thorax; like most Pierid pupae they are placed upright, are hooked at the cremaster into a silken pad and are held upright by a long, loose girdle.

C. palaeno L. (= philomene Hbn., lapponica Stgr., werdandi H.-Schäff.) (27a). I have before me palaeno. a 3 from Canada, from the collection of Herr LEOPOLD HARTMANN of Würzburg (to whon I am indebted for the loan of his North American Pierids). It is above not distinguishable from German specimans (europome Esp.), but much more yellow on the under surface; the colouring of the hindwing approximates to that of the $\varphi \varphi$ of pelidueides. europome. - At Hudson's Bay and in Alaska occurs pelidneides Stgr., which according to STAUDINGER differs from *palaeno* in that the median spot of the hindwing beneath is not white, but reddish as in *pelidne*; *pelidne*, however, commonly varies in this, yet this median spot is always much smaller in that species than in palaeno. — Larva sea-green, velvety, with fine black dots, at the sides a bright yellow longitudinal stripe margined with black beneath, below which the white, black-edged spiracles are placed, venter and ventral legs dull green, thoracic legs yellowish, head green; on Vaccinium uliginosum. Pupa greenish yellow with strongly convex dorsum. In the Palaearctic Region the butterfly flies from the end of June to the middle of August on marshy ground.

C. pelidne Bdr. (= anthyale Stgr.) (27a), from Labrador and boreal North America, is paler yellow than palaeno, and has narrower and less dark distal margin, the under surface is likewise much paler, greenish

KH pelidne.

COLIAS. By J. Röber.

on the hindwing, the median spots of the under surface are smaller, as also those of the upper surface, the latter often absent. The Q is above yellowish white with only narrow, proximally diffuse dark margin to the forewing. - uubrado- 549 labradorensis Scudder can scarcely be distinguished. The 3 has narrower distal margin, which is almost broken rensis. up into spots by small stripes of the ground-colour, and the φ has no dark distal margin. ab. moeschleri Gr.- moeschleri, 544 Grsh. is darker vellow, almost orange-yellow. — In Dr. STAUDINGER'S collection there are specimens which might be treated as hybrids of *pelidne* and *nastes*; upper surface greenish yellow, veins black-brown, the dark margin sharp. This form may be named **standfussi**. — pelidne is not a constant form, but on the other hand does not standjussi. 570 vary very much, so that no positive characteristics can be given for **skinneri** Barnes. — **chippewa** Edw., from skinneri 551 the Mackenzie River (British North America), appears to be a transition between pelidne and palacno; STRECKER considers it a form of palaeno; it is an aberration very difficult to differentiate. The Q is more like a Q of palaeno than of pelidne.

C. philodice Godt. (= dorippe Godt., palaeno Cr., europome Steph.) (27a) (the Common Sulphur or Puddle philodice. 533 Butterfly), is distributed from New England to Florida and westwards to the Rocky Mountains. This species is very common and often occurs in swarms, enlivening the edges of the roads and clover fields. It only varies a little in the width of the black margin. White $\varphi \varphi$ are distinguished as ab. **alba** Stgr. i. l. — ab. **anthyale** Hbn. is a form with anthyale for anthyale for the black margin. narrow dark margins. - In Guatemala occurs guatemalena Stgr. i. l., a deeper yellow form with somewhat guatemalena 33 broader dark margin to the upper surface. The under surface is somewhat more strongly dark-marked. -Egg light yellow to red, iridescent. Larva slender, green, with light green longitudinal stripes; lives on clover. Pupa light green.

C. chrysomelas Hy. Edw. (27a, b), from the coast districts of North California, is larger and in the chrysomelas. male more glossy, also with broader dark margin than philodice. The under surface is dark orange, light yellow in the middle of the forewing. The φ is much lighter yellow and has in the broad distal margin of the forewing. larger, but diffuse yellow spots. The under surface is light yellow.

C. hageni Edw. (27b), from Canada, has the forewing narrow and pointed, particularly in the male. hageni. 537 The upper surface in the \mathcal{J} is beautifully yellow, the black distal margin of the forewing, contrary to that of other allied species, broadest at the inner angle. The ground-colour of the under surface is but little different from the upper. The Q is grey-yellow, has broader grey-black distal margin, in which large yellow spots are placed, the under surface is grey-yellow.

C. alexandra Edw. (27b) (the Alexandra Sulphur), from Colorado, is in the 3 above similar to philodice, alexandra. but has more glossy yellow ground-colour with orange-yellow tinge, particularly on the hindwing. The under surface, however, is very different in both sexes, namely silver-grey on the hindwing with silvery median spot. The φ is light yellow, has a small dark distal margin to the forewing or none at all, but black median spot, and is sometimes suffused with orange-yellow.

C. edwardsii Edw. (27b), from Virginia, has the upperside lemon-yellow mixed with orange, with narrow edwardsii. dark margins. The under surface is as uniform as in alexandra, but yellow, sprinkled with black on the hindwing, the distal margin is reddish. Probably a form of alexandra.

C. harfordi Hy. Edw., from California, is lighter yellow above, with narrower dark distal margin, inter- harfordi. 567 sected by the yellow veins, and is still less marked beneath, in the female showing the beginning of a submarginal macular band on the forewing and narrower distal margin (proximally dentate) than barbara Hy. Edw. (27b, c), barbara, 562 which also occurs in California. The lemon-yellow β has narrow dark distal margins, the almost sulphur-yellow φ only a diffuse distal margin to the forewing. The under surface is similar to that of philodice.

C. boothii Curt. (27c), from arctic America (Boothia felix), occurring up to lat. 75°, appears to be very boothii. TTS rare. The markings in the sexes are not so different as is the case in the allied species. The 3 has besides the dark distal margin on the forewing an almost complete submarginal band and on the hindwing the beginning of one. The under surface, particularly in the 3, is strongly greenish. In ab. chione Curt. (as in the Palaearctic chione. 504 nastes ab. insignata, vol. I, pl. 25c) the dark distal margin of the forewing is wanting. - Flies from the middle of July to the middle of August and is fond of resting on the flowers of Oxytropis arctica and campestris (CURTIS).

C. interior Scudd. (= occidentalis Scudd., emilia Edw., astraea Edw.) (27c), from South Canada and interior. 565 the Rocky Mountains (the Pink-edged Sulphur), is very similar to philodice, but the dark distal margins are much narrower and the yellow ground-colour runs into them in streaks, the fringes are rose-red. On the underside the apex of the forewing and the anterior part of the hindwing are rusty orange-vellow. The \mathcal{Q} has almost white upper surface and broader, but diffuse, distal margin to the forewing.

C. scudderi Reak. (27c) (= Scudder's Sulphur), from Colorado, Utah, Montana and British Co-scudderi. 566 lumbia, has broader, but grey-besprinkled dark distal margin. The φ is usually white, very rarely yellowish, and has only traces of dark margining. The under surface of the 3 is yellow, dusted with grey-green at the

COLIAS. By J. Röber.

apex and distal margin of the forewing as well as on the hindwing, particularly at the costal margin. The silvery median spot of the hindwing is edged with reddish. Larva on bilberry and willow. EDWARDS' attempt at breeding was unsuccessful, as the larvae died during the winter. -- The butterfly flies in July at an altitude of 9000 ft.

the nastes. C. nastes Bdv. (27d) (the Arctic Sulphur), from Labrador, Greenland, Alaska and the Rocky Mountains in British Columbia, is dark grey-green with grey-black margins and red fringes. The Q is more yellowish and has more distinct yellowish submarginal spots on both wings. The under surface of the forewing is impure whitish, with greenish yellow scales, the rose-red fringes are conspicuous, the hindwing is yellowish green, lighter at the margin, the white median spot is bordered with red and distally to it is placed a diffuse red spot, the rosered fringes are broader than on the forewing. The Q has a somewhat lighter under surface and on the forewing $f_{norma}^{(rossii)}$ some small black submarginal spots. — rossii Gn., from Boothia felix, has in the \mathcal{J} a gold-yellow centre to the *hela*, forewing above, the \mathcal{Q} is white. — hela Strecker, moma Strecker and streckeri Gr.-Grsh., from Hudson's Bay, streckeri, are aberrations which cannot be accurately fixed, as the species varies as strongly in America as in Lappland (werdandi).

C. behri Edw. (27d), from the mountains in the west of North America, principally of California, is a very variable species. The \Im is above yellowish green, densely and regularly powdered with blackish, with conspicuous yellow median spot on the hindwing. The dark distal margin is indistinct on the forewing, but sharply defined on the hindwing. The fringes in the \mathcal{J} are yellowish, in the φ rose-red. The under surface in the \mathcal{S} is green-grey, the median spot is indistinct on the forewing, but on the hindwing conspicuous, as above, the costal margin of the hindwing is red. The φ has darker under surface and red fringes.

C. imperialis Btlr. (27d), from Tierra del Fuego (Port Famine), is in both sexes so characteristically marked that it is impossible to confuse it with any other known species. Upper surface in the 3 deep orangered, the distal margin on the forewing broad, occupying fully a third of the wing, but narrower on the hindwing, both wings with large black median spot, inner margin of the hindwing yellow, under surface greenish yellow, middle of the forewing orange with light-centred black median spot and black submarginal markings and similar ones at the inner margin, hindwing with orange-red median spot and indistinct orange-yellow spots round the discocellular. Q less vivid orange with broader marginal markings, in which orange-red spots are placed, ground-colour of the under surface much more greenish than in the \mathcal{J} , but with the same markings. The locality of this species has not as yet been established with certainty, but is probably correct.

C. vautieri Guér. (27e), from Chile, is in the 3 above orange-red with broad black-brown margin and median spot of the same colour on the forewing, the black-brown margin of the hindwing is much narrower and is suddenly reduced towards the inner angle; the hindwing has a smaller, indistinct dark median spot. The under surface of the forewing is orange-red, at the margins and particularly at the apex yellowish, and has a black median spot and a submarginal row of black spots, which are larger posteriorly. The under surface of the hindwing is yellow, slightly orange in the middle, the reddish median spot has a light centre, a reddish diffuse spot is placed at the base of the wing and in addition there is a row of small reddish submarginal spots; the inner margin is greenish. The Q has above yellowish white ground-colour, broader dark distal margins on both wings and light submarginal spots. The ground-colour of the underside of the forewing is impure white, of the *ratilans.* hindwing yellowish. ab. **rutilans** *Bdv*. are 33 with broader dark margin.

C. cunninghami Btlr. (27e), from Eeuador, is only known in the male. Similar to vautieri, but larger, apical and distal-marginal border narrower, fringes orange-yellow. Under surface differing but little from that of vautieri, the reddish spots of the hindwing larger, the black spots of the forewing on the contrary smaller, fringes rose-red.

C. minuscula Btlr. (27e), from Ecuador, is apparently nothing but a "miniature edition" of cunninghami. The \mathcal{Q} has white ground-colour, is similar to the vautieri- \mathcal{Q} , has on the upper surface of the hindwing less marginal marking, but is more strongly marked on the under surface, particularly of the hindwing.

C. meadi Edw. (27d), from the mountains of Colorado, has orange-red ground-colour and almost uniformly broad, light-sprinkled, dark distal margin. In the 3 the median spot of the forewing is only indicated, in the Q distinct, with light centre. The latter has small yellowish spots in the dark distal margin. The under surface is strongly yellow, in the middle of the forewing orange-red with conspicuous white, red-bordered median spot on the hindwing, less conspicuous dark median spot on the forewing and rose-red fringes. No white 99 seem to occur in this species. — Larva on clover, not different from the elis-larva. Pupa shaped like that of philodice, colouring green-yellow, ventral side more vivid than dorsal, head-projection yellow, a dark dorsal costal line, small whitish spots on the whole body, wing-cases granulated. - Flies in July.

C. elis Strecker (Strecker's Sulphur) (27f), from the western mountains of North America (Rocky Mountains), has brilliant orange-red ground-colour and much narrower dark distal margin than meadi. The Q has paler ground-colour and much more yellow submarginal marking. The under surface is more sombre on

imperialis.

St behri.

hami.

St vauticri.

minuscula.

Amcadi.

Addis.

COLIAS. By J. Röber.

93

account of the dark scaling. According to STRECKER white QQ also occur. The larvae hatch at the end of July, in captivity they pupate in the middle of April. The full-grown larva is dark yellow-green, on the back somewhat lighter than at the sides, densely covered with short black hairs which are placed on small tubercles, each of which is surrounded with whitish, on each segment a black spot (occasionally absent), above the legs a white stripe, head light green. Pupa like that of meadi.

C. eurytheme Bdv. (= amphidusa Bdv.) (27f) is distributed from Canada to Mexico and from the eurytheme. 500 Atlantic to the Pacific; the species does not appear to ascend high in the mountains. It is extraordinarily variable. - In hecate Weeks the wings are apparently somewhat more pointed, the veins in the apex of the fore- heeate. 201 wing are less prominently yellow, the ground-colour is somewhat deeper orange-red. Q-ab. alba Weeks is dis- alba. 542 tinguished from the similar eurytheme-form ab. albina (= alba Stgr. i. l.) by more sharply defined and rounder albina 583 white spots in the dark distal margin. - keewaydin Edw. is the winter form with paler ground-colour in both keewaydin 574 sexes; the 3 has often a narrower dark distal margin. - The summer form eriphyle Edw. (27e) has yellow ground eriphyle 515 colour and is above only distinguished from philodice by the yellow veins in the apex of the forewing. - ariadne ariadne. 580 Edw. (27f) suggests a distinct species on account of the localized distribution of the yellow and the orange-red colouring and by the narrow distal margin. - californiana Mén., from New California, is compared by the californiana 59 author with the European edusa; in the description no definite differential characters are given; the under surface is said to be as in myrmidone. - autumnalis Cock. is similar to eriphyle, but smaller, with narrower margins, autumnalis. 57 the hindwing is more grey-green. Flies in the autumn and spring. - Full-grown larva with dark velvety green back, on each side a narrow white line, on which are placed irregular shiny vermilion spots, some of them being shaded with orange-yellow. Under surface green. Pupa green with a stigmatal yellow line, above which on each segment is placed a brown dot, a subdorsal brown spot, which begins at the margin of the wing-cases and occupies two or three segments. Egg greenish white, transparent, pointed at one end and obtuse at the other, longitudinally ribbed, with oblique stripes between.

C. christina Edw. (27f, g), from the Slave River, has slight orange-red ground-colour and is conspicuous christina. by the yellow basal part of both wings. The underside has no markings except the median spot. The φ is almost white, its forewing with only a little dark dusting at the distal margin and black, white-centred median spot.

C. lesbia F. is distributed from South Brazil (Rio Grande do Sul) southwards and westwards into the lesbia. 590 high mountains. Specimens from South Brazil, Uruguay and Argentina differ so little that they cannot be separated. This form is in the male dark orange-yellow, specimens with violet reflections are not rare; the blackbrown distal margin is not sharply defined proximally. The under surface with the exception of the reddish middle of the forewing is vivid yellow with the usual Colias-marking. The ground-colour of the upper surface in the QQ is very variable: orange-yellow, yellow, yellowish or white with grey dusting; greenish grey specimens also occur. The white Q-form has the name ab. heliceoides Capr. Probably the name pyrrhothea Hbn. (27g) heliceoides. 59 applies to the form from South Brazil, Uruguay and Argentina, whilst the paler specimens from Patagonia should be regarded as the true lesbia. - andina Stgr., from Bolivia (3000-4000 m), is sprinkled with blackish andina. and has a larger reddish basal spot on the underside of the hindwing. - arena Stgr., from Tierra del Fuego (Punta arena.594 Arenas), has narrower forewing with more pointed apex, light orange-yellow upper surface and broader dark distal margins. - antarctica Stgr., from Tierra del Fuego, is a white Q-form with unspotted distal margin. - antarctica. 995 puna Fruhst., from Peru (Puno, 12 500 ft. elevation), has rounder wings, more thickly and darkly scaled, and puna. 576 narrower dark distal margin to the hindwing. - Flies from November to January. CH. DARWIN observed a large swarm of these butterflies in Patagonia.

C. hecla Lef. (= boothii Bdv., groenlandica Rühl, glacialis Mc. Lachl., hela Strecker) (27 g) occurs in hecla. 59/ Greenland and extends there to lat. 82°. It differs from the Palaearctic form sulitelma Auriv. by dark, duller pallida. 598 ground-colour; the under surface has the same character. - pallida Skinner & Mengel is a lighter form.

C. dinora Kirby (27 g), from Ecuador (12 000-16 000 ft.), is orange-yellow, with washed-out, moder- dinora. 594 ately broad dark distal margin to the forewing; the hindwing has a submarginal row of small, dark, inconspicuous spots. The under surface on the forewing is somewhat lighter, on the hindwing somewhat darker than the upper, the median spot is white, small and margined with reddish. The φ has lemon-yellow ground-colour and yellow spots in the dark distal margin of the forewing — alticola Godm. & Salv., from Peru (3000 m), alticola 600 is larger, has somewhat blue reflections, darker and broader distal margin to the forewing, also narrower distal margin to the hindwing, more distinct median spot, sharper yellow colour on the basal part of both wings and somewhat lighter, but more strongly marked under surface.

C. flaveola Bl. (27 h), from Chile and Bolivia (mountains), is pale orange-yellow in the Q, in the rather flaveola. GH broad dark distal margin of the forewing are placed four large yellowish white subapical spots, the under surface has dull sulphur-yellow ground-colour. Deeper orange-yellow coloured female specimens are common saturata. 60, and may be designated ab. saturata. — euxanthe Fldr. (= Scalidoneura hermina Btlr.) (27 h), from Peru, euxanthe. differs but little. The upper surface is deeper coloured and the under surface more strongly marked. White alba. 674 \mathcal{Q} go by the name ab. alba Stgr. i. l.

MEGANOSTOMA: NATHALIS. By J. Röber.

C. dimera Dbl. dettew. (= erythrogramma Koll.) (27 h) is likewise a mountain species indigenous to Colombia,Peru, Ecuador, etc., and apparently little variable. The upper surface of the forewing is orange-yellow, thatof the hindwing lemon-yellow. The dark margin of the forewing is moderately broad, that of the hindwingsomewhat variable, occasionally it is entirely wanting, as also the black median spot of the forewing. Theunder surface is sulphur-yellow and has a row of reddish submarginal spots, a diffuse spot at the base and a $white, red-bordered median spot on the hindwing. The <math>\varphi$ is above and beneath yellowish white.

25. Genus: Meganostoma Reak.

The species of this genus were formerly united with *Colias*. But apart from differences in neuration the *Meganostoma*-species are even superficially characterised by the sharply pointed forewing. The $\varphi \varphi$ have an organ which is only observable in newly emerged specimens on account of its being so very perishable, namely soft, membranous, three-jointed structures on the tarsi of the middle and hindlegs, which have been named eupronechiae by their discoverer REAKIET. Their purpose is not known. *Meganostoma* is further well differentiated from the other Pierids by the absence of a pad between the claws. The larvae live on Leguminosae.

V eurydiee.

(dimera.

M. eurydice Bdv. (= φ lorquini Bdv., wosnesenskii Mén.) (26 f) (the Californian Dog-face), from California, has in the male a brilliant sheen on the upper surface only rarely occurring in Pierids. Occasionally also the hindwing has a narrow black distal margin. The Q is unicolorous vellow with a large black median spot on the forewing and reddish marginal spots. The marking of the under surface in both sexes is thoroughly Colias-like. The larva lives on Amorpha californica. Egg spindle-shaped, thick in the middle, running out into a rounded point, with longitudinal ribs. Full-grown larva cylindrical, of uniform thickness from segment 3 to 11, densely covered with small black tubercles, on each of which a very fine black hair is placed, from segment 3 to 11, a narrow white band above the legs, above this band on the 3. and 4. segments, in the middle of each segment, is a glassy, semicircular appendage, black with purple reflection; on the remaining segments this structure is only occasionally found. Colour dark green, underside blue-green, also the legs; head round, only a little depressed at the vertex, strongly covered with fine black dots, each of which bears a short black hair. Pupation takes place six days after the larva ceases to feed. Pupa laterally compressed, the thorax projecting on the ventral side and forming a narrow prominence, abdomen pointed, conical, mesothorax less projecting than in C. eurytheme and philodice, low, rounded, with a low keel, behind which there is a slight incision. Head apple-green, a white stripe at the sides of the abdomen. Duration of the pupal stage nine to ten days.

M. cesonia Stoll (= sesonia Mart., caroliniana Pet.) (26 f) (the Southern Dog-face) is distributed from the United States of North America to Argentina. The \mathcal{Q} has reduced marginal marking, the black marking *cesonides*. at the distal margin of the hindwing is always absent. — **cesonides** Stgr., from Bolivia (3500 m), is smaller, *from Venezuela*, has on the under surface of the hindwing red longitudinal stripes (is doubtless only an aber*ecutral*-hindwing. — **centralamericana** Stgr. i. l., from Colorado, has small black stripes instead of the black distal margin of the *central*-hindwing. — **centralamericana** Stgr. i. l. has very broad black margin also to the hindwing and on the latter *bernardino*, orange-yellow spots before the black distal margin. — **bernardino** Edw. is only a small form.

M. philippa F. (26 e), from Bolivia, has in the \mathcal{J} the apex of the forewing rounded, in the \mathcal{Q} on the contrary it is rather pointed. In the marking there is no constant difference.

M. cynops *Btlr.* (26 e), from Haiti, has the apex of the forewing rounded in both sexes. The \mathcal{J} has broad black margin, in the \mathcal{Q} this is broken up into spots.

M. helena Reak. (26 e), from Bolivia, has, especially in the female, the forewing very sharply produced. The \mathcal{J} has no black margin to the light orange-yellow hindwing, in the \mathcal{Q} the hindwing is likewise without markings except the yellow median spot and on the forewing the margin is broken up into spots. The under surface in both sexes has a considerable amount of red marking.

M. therapis *Fldr.* (26 f), from Venezuela and California, has the forewing sharply pointed. The \mathcal{J} is lemon-yellow, the \mathcal{Q} light sulphur-yellow. Both have strongly reduced distal-marginal marking and on the under surface much red marking.

Very probably the genus *Meganostoma* has only two species, *eurydice* and *cesonia*; all the other forms described above I should consider only aberrant forms or slight local modifications of *cesonia*.

26. Genus: Nathalis Bdv.

This genus only embraces two small species, of which even the superficial appearance forbids any confusion with other genera. The antennae have strikingly knob-like clubs. The palpi are rather hairy than scaled and the subcostal has three branches, two of which branch off before the discocellular.

R philippa. - Reynops. Phelena.

EUCHLOË; ANTHOCHARIS. By J. Röber.

N. jole Bdv. (= felicia Poey) (27 h), from the southern States of North America, Mexico, Colombia jole. 61 and Cuba, is lemon-yellow with black apex and black innermarginal stripes on the forewing, also at the costal margin of the hindwing there is a long black spot. The \mathcal{Q} has the upper surface of the hindwing pale orangered. ab. irene Fitch (27 h) is a \mathcal{Q} -form with the hindwing deeper orange-yellow and more strongly marked irene. 619 with black. — luteolus Reak., from Honduras, is a more orange-yellow form, strongly marked with dark. Interview. 619

N. plauta *Dbl.* & *Hew.* (27 h), from Venezuela and Colombia, has yellow upper surface, very broad black *plauta* \mathcal{C} distal margin to the forewing and a large orange-yellow spot at the anterior part of the hindwing. Under surface of the forewing in the middle orange-yellow, at the margin greenish yellow, the hindwing greenish, yellow at the margin. The φ has the upperside of the forewing almost black.

27. Genus: Euchloë Hbn.

Of this genus, which is represented in the Palaearctic Region by nine species, there are only three in the American Region. Antennae and palpi shaped as in the following genus *Anthocharis*. Of the five subcostal veins only one arises before the apex of the cell. The upper radial is coincident with the subcostal almost to $\frac{1}{8}$. — Egg spindle-shaped, with small protuberances at the sides. Larva slender with small head. Pupa pointed at both ends, the breast only a little raised.

E. ausonides *Luc.* (28 a) is distributed from Colorado to California, also occurring on Vancouver Island. *ausonides.* "Fill Upper surface white with black median spot and grey-black apical and subapical markings on the forewing. Under surface white with black median spot on the forewing and yellow-green "parsley"-marking on the hindwing and the apex of the forewing. — Larva on Crucifers, cylindrically slender, head small, round, green, black-spotted, body entirely covered with black granules, each of which bears a short hair, longitudinally marked with three pale-coloured stripes, a dorsal one and one at each side, the interspaces yellow, the lateral stripes margined beneath with white to yellow; ventral legs greenish yellow, thoracic legs black. Pupa slender, cylindrical, thickest in the middle, uniformly pointed, grey-brown, and covered with fine dark longitudinal stripes.

E. creusa *Dbl. & Hew.* (28 a), from the Rocky Mountains, is similar to the preceding species, but the *creusa*. 522 black median spot of the forewing is large and square. The markings of the under surface are grass-green and the light spots on the hindwing are silver-white. Almost nothing is known of the early stages.

E. hyantis Edw. (28 a), from California, is above very similar to creusa, but on the underside of the hyantis. 623 hindwing more yellow-green and the spots are there only white but not shiny.

28. Genus: Anthocharis Bdv.

This genus is only represented in America by four species. It differs from the preceding genus in that two subcostal veins arise before the discoccellular. The upper radial is only shortly coincident with the subcostal. Larva slender, narrower at both ends, with soft hairs. Pupa canoe-shaped, with strongly projecting breast (boot-shape), produced into a point at the ends, weakly keeled on the back.

A. sara Luc. (= flora Wright) (28 a) is distributed all over the United States of North America. Upper sara. 624 surface white with large orange-red apical spot, which is margined with black distally and proximally. Hindwing white, ab. reakirtii Edw. (28 a) differs from sara by the presence of black dots at the distal margin of reakirtii. 625 the hindwing. The φ of sara has slightly yellowish upper surface and smaller and paler orange spot. ab. stella stella. 626 Edw. has in the β the bordering round the orange spot less black, also the spot itself is smaller and paler; the φ has yellow upper surface. ab. julia Edw. (28 a) differs from sara in that the proximal black bordering of the julia. 62f orange spot is interrupted and the hindwing has larger black marginal spots. — Earlier stages unknown.

A. thoosa Scudd. (28 a), from California (which is only known to me from the figure), shows in pattern thoosa. \mathcal{GU} no difference between the sexes, only the ground-colour of the \mathcal{J} above and beneath is white, that of the \mathcal{Q} yellowish. Is probably scarcely a separate species, but a large, strongly marked form of sara.

A. cethura Fldr. (= angelina Bdv., cooperi Behr) (28 a), from California, has in the \mathcal{E} the distal margin *cethura*. \mathcal{E}^{29} of the forewing somewhat incurved. Upper surface white with small orange spot, very small dark apical markings, and black median spot. \mathcal{Q} with stronger black markings. ab. morrisoni Edw. has larger and darker orange morrisoni. \mathcal{E}_{20} spot also more black apical marking. — For this species GROTE has erected the genus Tetracharis.

MIDEA; ZEGRIS; EROËSSA. By J. Röber.

A. pima *Edw*. (28 a), from Arizona, flies at the middle of March. Upper surface in both sexes yellow, the black apical marking sometimes encroaches more or less on the yellow subapical spot. Under surface of the hindwing yellow-green and marked with white.

29. Genus: Midea H.-Schäff. (Gnanne, im Vielunda.

The principal character of this genus consists in the shape of the wings, the forewing is somewhat falcate. The neuration is scarcely different from that of *Anthocharis*. It is therefore purely a matter of opinion whether the following species should be added to *Anthocharis* or associated in a separate genus.

Benutia. M. genutia F. (= midea Hbn., l'herminieri Godt.) (the Falcate Orange-tip) (28 b) occurs throughout the United States, in the north in one generation, in the south in two. Upper surface in both sexes white with black median spot and black apical markings, the 3 with orange-yellow spot in the apex of the forewing. Under surface white with grev-green markings on the hindwing and the apex of the forewing. - Egg long, narrow, thickest in the middle, moderately rounded towards the base, the latter broad and flattened, suddenly narrowed towards the apex, so that the upper half is conical, the apex impressed, the micropyle surrounded by small, irregular hexagonal cells, vertically ribbed, the number of the ribs about 16, of which half reach the tip and the others terminate not far from it, the interspaces filled up by numerous fine grooves. Colour yellow-green. Duration of the egg-stage four days. Full-grown larva cylindrical, slender, head broad, colour dark yellow-green, shiny, underside, ventral and thoracic legs lighter, a yellow band in the middle of the back from the 2. to the 13. segment, a broad white band above the legs, upperside decorated with six longitudinal rows of shiny black tubercles, each with a short black hair which is thicker at the end. Pupa slender, abdomen long, round and pointed, head with a pointed appendage, on the ventral side of the thorax an almost triangular, laterally compressed lump, which is hidden by the wing-cases; colour usually light yellow-brown with a reddish tinge and darker on the mesothorax, the prolongation of the head brown, the wing-cases more or less spotted and striped with black, at the back of the abdomen a row of small black spots, two to four on each segment, and a subdorsal row of small spots or dots.

V limonea.

M. limonea *Btlr.* (28 b), from Mexico, is much larger than *genutia*, has the upper surface of the hindwing yellow, and the forewing is not pure white as in *genutia*. The marking at the apex of the forewing is rather different from that of *genutia*.

Chanceolata
 M. lanceolata Luc. (Boisduval's Marble) (28 b) is distributed from North California to Alaska, but rare. The upper surface is white with black median spot and slight blackish apical markings, which are enlarged in the Q. The under surface is sprinkled with brown, the veins especially are distinctly scaled with brown. — Larva green, laterally light blue with white stripes, also with small black dots, each with a short black bristle; it lives on Turritis.

30. Genus; Zegris Rbr.

The Palaearctic species of this genus are distinguished by their life-history. The larvae do not pupate free like most other Pierids, but in a cocoon in which traces of the girdle are still present. As the larva of the only American species is not yet known, it cannot be proved with certainty whether it belongs to this genus. But according to the neuration and the marking of the under surface olympia belongs to the genus Zegris.

(Solympia. Z. olympia Edw. (28 b), from Texas, is white above, with large black median spot and small, shadowy apical markings. The under surface has the markings shown in the figure, which are somewhat reduced in the rosa. ab. rosa Edw.

31. Genus: Eroëssa Dbl.

This genus is nearly allied to the Palaearctic and North American *Euchloë* and *Anthocharis*, in it, however, both the radials of the forewing are free and the cell is consequently closed by three discocellulars. The forewing has slightly undulate distal margin and five-branched subcostal, the two first subcostals arise before the end of the cell, the third far behind it. The precostal is directed proximally. The palpi are very slender, anteriorly long-haired. The only species of this genus inhabits the high mountains of Chile.

chilensis.

E. chilensis *Guér*. (28 c) has white ground-colour on the upper surface, with black apical half of the forewing, in which is placed a large orange-red spot. The hindwing has a row of black marginal and submarginal

96

(3) pima.

ANDINA; PHULIA. By J. Röber.

spots; in the Q the latter are larger and hook-shaped, also the orange-red submarginal spot is narrower and there are two white spots in the apex of the forewing. Beneath the ground-colour of the hindwing in the 3 is white, in the \mathcal{Q} light yellow; the black spots placed in the middle of the hindwing are more distinctly edged with rustvellow in the 5. Apparently rare and local.

32. Genus: Andina Stgr. 7. super-

This genus, containing only one species, inhabits the mountains of Bolivia at the highest limit at which animal life can exist. The butterfly was discovered by G. GARLEPP at an elevation of about 5800 m. The upper surface of the species presents the appearance of a pale-coloured Colias, the under surface is also Colias-like, but the veins and the structure of antennae show that it is not very closely allied to this genus. The antennae have distinctly knob-shaped clubs, the lower radial of the forewing arises directly from the subcostal, hence the upper and middle discocellulars are wanting; the upper radial does not arise until far beyond the discocellular. The hindwing has a well developed precostal, directed proximad.

A. huanaco Stgr. (28 c) is in the 3 white above, the smaller Q yellowish, the base suffused with black- huanaco. ish, the forewing has a marginal and a shorter submarginal band as well as a large black median spot, hindwing without markings. Under surface of the forewing white resp. yellowish, costal margin and apex dusted with grev, with smaller subapical spots and smaller median spot. Under surface of the hindwing dark grev, more or less dusted with yellow-brownish, with a light median spot and a row of not very distinct blackish submarginal spots. — GARLEPP says: "it flies only on the highest summits of the Cordilleras, amidst the wildest boulders and most desolate masses of rock; I cannot understand its choosing such wastes and deserts, or how it can exist there at all, where it must sometimes be daily covered with snow and ice, where there is absolutely no vegetation, and where only the condor makes his abode". In these heights a tempestuous wind constantly prevails, so that the insect can only fly in the brief lulls. Was taken in February.

33. Genus: Phulia H.-Schäff.

The habits of this genus are almost the same as those of Andina, except that Phulia does not ascend to the summits of the mountains, but stops at a height of from 4000 to 5000 m. The species fly at the same time as Andina. -- Whilst in Andina the second subcostal vein branches off at the discocellular, in Phulia it mostly arises before the end of the cell, occasionally at the cell-end (nysias), on the other hand the lower radial is always coincident with the subcostal, though sometimes only for a little way (nympha); the cell is therefore only closed by the lower discocellular. The species are very similar. The genus most nearly allied to this and the preceding one is Baltia, from the highest mountains of the Palaearctic Region.

P. nymphula Bl., Stgr. (28 c) has been described from specimens from Chile, but STAUDINGER identifies nymphula. a species from Bolivia (that figured as nymphula) with it. BLANCHARD's figure does not appear to be accurate; so long as no Chilian specimens can be compared it remains uncertain whether the form figured is the true nymphula. It is one of the larger species of the genus.

P. nympha Stgr. (28 c, d), from Bolivia, is the largest species of the genus and has also the most mark- nympha. ings both above and beneath. Very striking, particularly in the 3, is the basally prolonged black median spot on the upperside of the forewing.

P. nymphaea Stgr. (= nymphula Weym., nymphula Stgr.) (28 d), from Bolivia (Illimani and Cocapota), nymphaea. V b has rather reduced black markings on both surfaces. The Q, in addition to an increase of the black markings on the forewing, has also rather large, wedge-shaped black spots on the upperside of the hindwing.

P. illimani Weym. (28 d), from Bolivia (Illimani and Cocapota), has somewhat stronger black apical illimani. V 64 marking, but no subapical one, and the black median spot is wanting. The under surface of the forewing has at the apex grey-yellow dusting only, but no black marking.

P. nymphagoga Stgr. i. l. (28 d), from Bolivia (Cocapota), is one of the smallest species, and has on nymphagoga 64 the forewing a considerable amount of black marking, also a black median spot, but in the 3 the hindwing is entirely without markings. The φ has on the forewing more black markings (the marginal macular band reaches to the inner angle) and the hindwing has rather large black marginal spots, also small submarginal spots, and is besides somewhat dark-scaled. The under surface, especially at the apex of the forewing, is more marked with black than in the other small species.

P. nysias Weym. (28 e), from Bolivia (Illimani and Cocapota), is distinguished at once by the under nysias. 1 644 surface of the hindwing, which (as in Andina huanaco) is grey with black spots. The $\varphi\varphi$ are vivid sulphur-

PSEUDOPIERIS; DISMORPHIA. By J. Röber.

vellow and have more black markings, also on the hindwing small black marginal spots, and the veins of the forewing are dusted with black.

P. nysiella Stgr. i. l. (28 d), from Bolivia (Cillutineara, 3000 m), taken by GARLEPP in January 1896, is the smallest species, with broader forewing. Upper surface white, hindwing without markings, forewing with sharply separated small black marginal spots, three larger black subapical spots and very small black median spot. Under surface similar to that of nysias, but the hindwing lighter grey, with much yellowish scaling, forewing with small, very indistinct subapical spots, median spot of the forewing absent. Q still unknown.

34. Genus: Pseudopieris G. & S.

With this genus begins a small group of genera which cannot with certainty be reckoned Pierids and yet can still less be associated with any other family. The position of the last genus Styx especially is very doubtful. Pseudopieris was formerly united with Dismorphia, but has rightly been separated from it. Although there is no decisive difference in the neuration, yet the much more Pierid-like facies, as well as the form of the short antennae, which do not at all possess the length characteristic of *Heliconius* or the Ithomiids, and also the want of striking sexual dimorphism, present sufficient generic characters. - According to the observations of Herr RICH. HAENSCH the forms of *Pseudopieris* do not differ essentially in habits from the *Pieris*-like Dismorphias.

P. nehemia is distributed from Mexico to South Brazil, and also occurs in the mountainous west. Upper nehemia, surface in both sexes white with black margin to the forewing. This is very narrow in nehemia, Bdv. (= cydno (whiridula. Dbl. & Hew.) (28 e), only exceptionally somewhat broader. It is not much broader in viridula Fldr., from Coacquato- lombia, which has slightly greenish upper surface. This border is much broader in the apex of the forewing *rialis*. in acquatorialis *Fldr.*, from Ecuador. The underside in all these forms is white on the forewing, yellowish on the hindwing and the apex of the forewing. A blackish spot on the discocellulars of the hindwing is occasionally absent in nehemia, in the other forms apparently constant.

Whether **P. penia** Hopff. (28 e), from Peru, is a separate species, I must leave undecided. In this form the black apical border is still broader than in *aequatorialis*, but in addition the border is strongly widened in the middle of the distal margin. As there is no blackish spot at the discocellular on the under surface of the hindwing, HOPFFER considers penia as a separate species. But as was shown in nehemia, the presence or absence of this spot cannot be taken as a specific criterion.

35. Genus: Dismorphia Hbn.

This genus is distributed from the southern states of North America to South Brazil and from east to west, especially developed in the western mountains, but most species have not a large area of distribution. All the species differ so considerably both in superficial appearance and in neuration from their relatives that they cannot be recognised as "Whites" without further examination. They doubtless represent another branch of the Pierid stirps. Their nearest relatives - with the exception of Pseudopieris - are the Palaearctic Leptidia and perhaps Pseudopontia from West Africa. A great number of the species resemble Ithomilds, Acraeids (Actinote) and Heliconines, which are protected by their bad smell and taste, yet cases of deceptive similarity are not common. Sometimes only the female is a so-called mimic. The sexual dimorphism in many species is so great that the identity of the sexes can only be proved with difficulty. - BUTLER not only retained HÜBNER'S genus Enantia (with melite as type), but also erected a further genus, Moschoneura (with methymna as type). Since there is neither any necessity for such a division, nor are the characters given for these genera tenable, the genus (which is also known under the name Leptalis Dalm.) is here retained in the customary extent. - I am indebted for the following biological notes to Herr RICH, HAENSCH, who made observations during his travels in South America, especially in Ecuador: larva and pupa are not known to him. The Ithomiid-like species, such as orise, theonoe, etc., like the Ithomiids, are fond of the shades of the thick forests of trees, whilst the more brightly coloured ones, praxinoe, astyocha, are also found in lighter places in the woods. The 33 of the latter when flying assume a position in which the large light spot of scent-scales on the upper surface of the hindwing is covered, so that they, like their $\varphi\varphi$, are not distinguishable from the similarly marked Mechanitis. Forms like nemesis, critomedia, leonora, etc., prefer small clearings in the woods and are fond of resting, with the wings spread out, on the tops of bushes upon which the sun shines. The seasonally common yellow and white forms, such as medora, limnorina, Pseudopieris nehemia, etc., make their appearance at the beginning resp. end of the rainy season often in large numbers on scented umbelliferous flowers by the wayside and at the edges of the woods; they do not differ noticeably from the true Pierids. The mimetic forms are scarcely distinguishable in their habits from the similar Ithomiids; they occur in the same localities as these, but do not fly in company with them. On the other hand their colouring regularly corresponds with the local forms of Ithomiids, which is especially well seen in the theonoe-forms.

A penia.

DISMORPHIA. By J. Röber.

99

D. cretacea S. & K. (28 e), from South Brazil (Espirito Santo), has white upper surface with broad cretacea. $\int J$ black apex, which, especially in the Q, is strongly sinuate in the posterior part. The hindwing has small black distal border. The under surface is yellowish white, the forewing without markings in the \mathcal{J} , in the Q with a black subapical band and a black spot near the inner angle, the hindwing has 2 black-grey transverse bands, of which one is placed in the centre, the other near the costal margin.

D. isodrita Bdv. (28 e), said to be from Brazil, known to me in one \mathcal{Q} from Colombia, is scarcely speci- isodrita. (57) fically different from *cretacea*. The black apical margin differs but little from that of *cretacea*, but has a very small white subapical spot, the hindwing is entirely without markings. The under surface is more yellow and the black subapical band of the forewing reduced to an indistinctly defined spot.

D. flavia Fldr. (H.-Schäff. i. l.), from Venezuela, is similar to isodrita, but is said to have shorter wings flavia. 653 and narrower cell. Unknown to me.

D. psamathe F. (28 f), said to be from Guiana and Para, only known to me from South Brazil (São *psamathe.* 653 Paulo and Santa Catharina), has in the black apex of the forewing a large white spot. The QQ have mostly strongly yellow hindwing. The under surface of the hindwing and the apex of the forewing are light ochre-yellow, the hindwing has 2 grey-black transverse bands, in the 33 the black subapical spot of the forewing is occasionally absent.

D. acutipennis Btlr., from Trinidad, only before me in a 3 from Colombia, differs from *psamathe* only *acutipennis*. 5^{54} in having a lighter yellow under surface. — **disjuncta** form. nov. (28 f), from Rio Grande do Sul, is distinguished *disjuncta*. 6^{55} by the proximal part of the black apical spot being broken up and the under surface as yellow as in *psamathe* (seasonal form of *psamathe*?).

D. mercenaria *Fldr.* (28 f) comes from Venezuela, I have before me specimens from Peru; whether *mercenaria*. 656 these are different from Venezuelan specimens I cannot say. It has in the male a somewhat narrower forewing and differently shaped margin to the black apical spots, but is otherwise, especially in the female, not different from *cretacea*.

D. licinia Cr. (= galanthis *Bates*, phronima F.) (28 f), from the Upper Amazon (Peru), is distinguished *licinia*. from *mercenaria* by the different shape of the proximal boundary of the black apical spot. The under surface is somewhat lighter yellow.

D. aphrodite *Fldr.*, from Brazil, is above chalk-white, distal margin black-brown with a white spot, *aphrodite.* 65% hindwing unicolorous. Under surface of the forewing in the 3 sulphur-yellow in the middle, costal margin and base saffron-yellow, small blackish dots at the costal margin, \Im unicolorous, costal and hind margins ochreyellow, black-brown apical band, hindwing in the 3 ochre-yellow, in the \Im much lighter, both beneath with brownish stripes. Unknown to me.

D. marion G. & S. (28 g), from Central America and South Brazil (Santa Catharina), is similar to marion. fogethere and the side of the forewing is less strongly marked.

D. thermesia Godi. (28 g), from Brazil (São Paulo), has the forewing very narrow in the male. In the thermesia. \mathcal{GO} \mathcal{Q} the oblong black median spot of the forewing is absent. The under surface is pearly white with dark scalespots, the \mathcal{Q} has also black subapical markings on the forewing, which are wanting in the \mathcal{J} . — thermesina thermesina. \mathcal{GO} Hopff., from Peru, has more black markings.

D. limnorina Fldr. (28 g), from Brazil (Minas Geraës), has peculiar wing-contour. The wings in the limnorina. 663 \bigcirc are entirely light yellow, in the \eth light yellow in the posterior half. The underside has black submarginal markings on the forewing in both sexes, but less in the \eth .

D. dilis *Bdv.*, from Brazil, is similar to *licinia*, but has on the forewing narrower and shorter black *dilis*.

D. theugenis *Dbl.* (= colon *Weym.*) (28 h), from Bolivia and Peru, has deep sulphur-yellow upper theugenis. δ^{64} surface with broad black apical marking and black median spot on the forewing as well as black margin to the hindwing. The under surface is sulphur-yellow except for the white posterior part of the forewing, the forewing has a black marginal spot in the middle of the distal margin and the hindwing 3 blackish transverse bands. φ unknown to me.

D. melite L. (28 h), from South Brazil (Santa Catharina and Rio Grande do Sul), has canary-yellow metite. ($e^{\int \partial f}$ upper surface with black marginal and central markings. The under surface as in the allied species is yellow with 2 blackish transverse bands on the hindwing. The QQ have broader forewing and much lighter yellow

= citrinella

Seornelia.

mirandola.

fasse

Jacish =

DISMORPHIA. By J. Röber.

alba. ground-colour, almost white specimens are not rare: ab. **alba** form. nov. — jethys Bdv. (= melite Koll.) (,,the Sjethys. black markings, such as a stripe from the base to the inner angle of the forewing.

D. cornelia Fldr. (28 h), from Mexico, has ochre-yellow upper surface with black-brown markings on the forewing and black-brown, irregular distal margin to the hindwing. The under surface with the exception of the whitish posterior part of the forewing is ochre-yellow with brownish spots and dots on the hindwing. conalia. — amalia Stgr. (28 h), from Chiriqui and Colombia, has much less dark marking on the forewing, especially the broad median stripe is entirely absent, and the hindwing has a uniformly broad dark distal margin. The ground-colour is above and beneath lighter.

D. mirandola Hew. (29 a), from Ecuador and Colombia, has black upper surface to the forewing with vellow markings. The hindwing is clay-yellow on the anterior part (scent-spot), sulphur-yellow on the posterior part, and has black markings. The Q has on the forewing more and lighter yellow markings, the hindwing is light sulphur-yellow with black distal margin. The under surface in both sexes is light yellow with hcauca. silver-white spots and dark dusting. — cauca form nov., from West Colombia (Cauca Valley), has in the S continuous yellow median band on the forewing, more reduced clay-yellow scent-spot on the hindwing, the vellow marking near the base of the forewing wanting.

D. carthesis Hew. (29 a), from Ecuador, is similar to mirandola, but has larger subapical spots on the forewing, no yellow marking near the base of the hindwing, but a larger yellow spot at the inner margin. The hindwing has a narrower yellow median band and much broader black distal margin. The under surface has on the hindwing a broad yellow median band and broad black distal margin, in which are placed reddish white submarginal spots.

D. idonia *Hew.*, from Ecuador, has the forewing similarly marked to that of *carthesis*, but the yellow spot at the inner margin is absent. The yellow median band of the hindwing is more obliquely placed. The under surface is entirely different: the grey-blackish hindwing has two yellow central transverse bands and some small yellow marginal spots.

D. zaela Hew. (29 a, b), from Colombia and Ecuador, has on the black-brown forewing in the 3 chromeyellow central and subapical spots. A large part of the hindwing is occupied by a grey scent-patch with a silky gloss, the posterior part of this wing is proximally yellow, distally chrome-yellow, the distal margin blackbrown. The \mathcal{Q} has light yellow markings on the forewing and a light sulphur-yellow hindwing with broad black margin. The under surface in both sexes is marbled with white and grey-brown.

D. arcadia Fldr. (29 b), from Colombia, is similar to the preceding species, but has in both sexes light canary-yellow markings. On the hindwing the 3 has one yellow band and the 2 two. The underside is similar to that of zaela, but much yellower.

D. crisia *Dru.*, from ,Brazil⁴, is about the same shape as *arcadia* and the markings are similar. The inner margin of the forewing is whitish, in the Q the median spots are smaller. — Only known to me from BOISDU-VAL'S description. ldr

D. medora *Dbl.* (Q = casta Koll.) (29 b), from Colombia and Venezuela, has also a yellow spot at the medora. inner margin of the forewing; on the grey, silky scent-patch of the hindwing there is a sharply defined, oval dorina, grey spot of scent-scales. The φ has much broader yellow markings. — medorina Hew., from Bolivia, has three larger vellow subapical spots on the forewing and the posterior yellow spot of the median band is separedorilla, ated from the other spots. The yellow band of the hindwing is orange-yellow in the anterior part. -- medorilla Hew., from Ecuador and Peru, has smaller yellow spots on the forewing and narrower yellow band on

albimacula Rob.

D. proserpina S. & K., from the Roraima, has above and beneath much lighter (almost white) markings proserpina. 🚯 demeter, than demeter form. nov. (29 b), from Colombia and Venezuela, the latter has moreover on the scent-patch of the hindwing no special, sharply defined scent-scale-spot like proscrpina (separate species?); proscrpina I only know from the figures and descriptions. The under surface is much vellower in *demeter* but is otherwise not different from that of proscrpina. Cothoë.

D. othoë Hew. (29 c), from Ecuador and Colombia, is above black-brown with yellowish markings. In the \circ the markings are more whitish and larger. The underside is pale yellow with blackish scale-markings.

D. zathoe Hew., from Colombia, is similar to othoë, but the median spots are smaller and yellower and the subapical spot is larger and white, also the band of the hindwing is more sharply yellow. Relex.

D. lelex Hew., from Ecuador, is somewhat larger than zathoe and has paler yellow markings, the median spots of the forewing are larger, on the other hand instead of the one large white subapical spot there are two

idonia.

Ezathoe.

DISMORPHIA. By J. Röber.

101

small yellowish spots. The hindwing is yellow and has only in the anterior part a proximally dentate black distal margin.

D. pimpla Hopff. (29 c), from Bolivia, has the yellow subapical spots differently placed, also yellow pimpla. 675 dusting at the base of the forewing. The hindwing has the black margin narrow but uniform.

D. pallidula Bilr, (29 c), from Costa Rica and Chiriqui, has white markings and a large, grey, oblong pallidula. 586 scent-patch on the hindwing.

D. lysis *Hev.* (29 c), from Ecuador, has the white markings enlarged, no subapical spots, and the φ lysis. (if has on the forewing a broad white median band reaching from the costal to the inner margin. The under surface has pearl-white spots and much grey-yellow scale-marking. — **peruana** form. nov., from Peru, is some-peruana. (if) what smaller, paler black and beneath with grey instead of yellow scales.

D. foedora Luc. (29 d), from Venezuela and Peru, is white above with broad black apex and two subbasal stripes, of which the posterior one is joined to the border of the distal margin; the hindwing has a moderately broad black border. The \mathcal{Q} has on the forewing less black marking, on the other hand almost the whole posterior half of the hindwing is occupied by the black border. Both sexes have small white subapical spots. The under surface is white with irregular dark markings. The \mathcal{Q} has more and darker markings.

D. virgo *Bates* (29 d), from Guatemala and Chiriqui, has black upper surface with white markings; virgo. 690 in the \circ the scent-spot occupies the whole posterior half of the hindwing and is shiny grey-white; the \circ has on the hindwing a broad white median band. — **Iubina** *Btlr.*, from Costa Rica, is distinguished by the white *lubina*. 691 median spot being divided by black veins. — **Iunina** *Btlr.*, from Costa Rica, differs in the \circ from virgo in that *lunina*. 694 the upperside of the hindwing is greenish at the inner margin.

D. lua Hew. (29 d, e), from Colombia. Ecuador and Peru, has very narrow forewing and broad hind-*lua*. $\int \int \int \frac{1}{2} \frac{1}{$

D. lycosura Hew., from Peru, has almost black forewing with a large light yellow spot in the middle lycosura. 694 and two small subapical yellow spots, hindwing grey-black with almost white scent-patch on the anterior part. Under surface grey-black with large yellow spots in the middle of the hindwing and some red spots at its base, at the costal margin of the forewing three small yellow spots. Only known to me from the figure.

D. leonora Hew. (29 e), from Ecuador, has a smaller yellow spot in the middle of the hindmargin *leonora*. bq^{2} of the forewing than *lycosura*, but also several small yellow spots. The hindwing is black-grey, on the greywhite, silky scent-patch (friction-area) of the hindwing is placed a rather sharply defined yellow scent-scalespot, the inner margin of the hindwing is broadly grey-blue. The φ is very different: white with broad black margins, a black band in the cell of the forewing and three small white subapical spots. Under surface pearlwhite with yellow interneural stripes in the δ , whilst the φ has blackish markings which correspond more to those of the upperside.

D. niepelti Weym.. which forms a transition to *lewyi*, differs from it in that the wedge-spot behind the middle of the costa in the 3 is reduced to a streak and the whitish inner-marginal spot of the forewing is so much enlarged that it extends beyond the median into the cell; from Ecuador.

D. lewyi Luc. (= nasua Fldr., \Diamond kadenii Fldr.) (29 e), from Venezuela, Colombia and Ecuador, has lewyi. **b**9° black upper surface with subapical and postmedial yellow spots as well as whitish stripes at the inner margin of the forewing. The hindwing is black-brown, the scent-scale-patch is yellowish, the broad yellow inner margin is divided into spots by the black veins. The \Diamond is yellowish white with broad black margins. Under surface pearl-white with yellow markings on the posterior and brownish markings on the anterior part of the hindwing. In the \Diamond these markings are black-brown, also the forewing has black-brown subapical markings and black-brown markings in the cell. — **boliviensis** Stgr. i. l., from Bolivia and Peru, has larger subapical boliviensis. and postmedial yellow spots on the forewing, but the light stripe at its inner margin is absent; the yellow markings on the posterior part of the hindwing are somewhat lighter.

D. schausi Dogn., from Ecuador (Loja), has a similar female to that of *lewyi*. Upper surface black- *schausii*. 69 grey with three white subapical spots and a small white spot at the costal margin at the discocellular, basal part of the forewing white, upper surface of the hindwing black-grey, anterior part bluish white, under surface of the forewing similar to the upper, but the subapical spots light yellow, hindwing black with yellow costal margin, a small yellow stripe in the cell and three red basal spots.

D. critomedia *Hbn.* (= crisia *Fldr.*) (29e, f), from Venezuela, Colombia and Brazil (?), has on the *critomedia*. 699 black forewing a strongly curved broad white median band, which in the φ is divided by a broad black stripe. The hindwing is white with black margins. Under surface white with dark markings.

= tolimense

DISMORPHIA. By J. Röber.

D. euryope Luc. (29 f), from Mexico, is above black with yellowish white median band on the forewing. The large friction-spot of the hindwing is light bluish, the scent-scale-spot on it white, from the inner margin to the middle of the hindwing runs a yellow band, divided into spots by the black veins. Only known to me from the figure.

D. ines spec. nov. (29 f), from Ecuador, is a good deal like euryope. The median band is much narrower and snow-white, at the inner margin of the forewing there is a small yellow scale-stripe. The φ has sulphur-yellow hindwing, broadly margined with black-brown. The underside has dull gloss, is grey-black and has white spots.

luadamis. D. lygdamis Hew. (29f), from Ecuador, has black upper surface with bluish markings. The under surface is much more like that of a Catasticta than a Dismorphia. Only known to me from the figure.

D. hyposticta Fldr., from Venezuela and Colombia, has in the female yellow upper surface with broad black-brown distal margin, interrupted median band and 3-4 small white subapical spots on the forewing, the yellow ground-colour of the hindwing makes a tooth into the dark distal margin between the 3. median vein and the lower radial. Under surface of the forewing similar to the upper, paler, with yellow marginal spots, hindwing black-brown with a number of large yellow spots. Only known to me from the description.

D. hippotas Hew. (29g), from Ecuador, has black-brown upper surface with white spots. The Q is very similar to the \mathcal{J} . Under surface impure white with yellowish spots of scales. The \mathcal{Q} has also black markings on the forewing.

teresa. D. teresa Hew. (= praxidice Hew.) (29g), from Ecuador, has black-blue, somewhat glossy upper surface with white spots. The 3 has besides the clay-yellow scent-spot at the costal margin of the hindwing a large , brand" on the upper surface in the middle of the forewing. The \mathcal{Q} is very similar to the 3. Underside similar to that of hippotas.~

axidiee. D. praxidice Hete., from Ecuador, has more rounded forewing than tercsa, somewhat darker under surface, otherwise no constant differences.

D. nemesis Latr. (= atthis Dbl.) (29g), from Mexico, Venezuela, Colombia, Ecuador, Peru, etc., has the upper surface of the forewing dark brown with small yellow spots, the anterior half of the hindwing (scentarea) is shiny grey, the posterior part yellow. The φ is very different: white or yellowish with black markings, the hindwing has only a narrow black distal margin. The under surface is grey with lighter and yellow idifascia, spots. — viridifascia Bltr., from Costa Rica, has smaller, linear yellow spots and on the hindwing a light greenish band. \mathcal{Q} with light brown margin.

D. cinerascens Sale. (29g, 30a), from Costa Rica and Chiriqui, is black above and has on the forewing white spots and on the hindwing a grey-blue, wedge-shaped band before the black distal margin. The $\widehat{\mathcal{Q}}$ has black hindwing with a broad white median band. The under surface is similar to that of nemesis.

D. melia Godt. (30 a), from Brazil (Santa Catharina and São Paulo), has the forewing black above with melia. yellow markings and the hindwing yellow with black markings. The φ is a so-called Acraeid-mimic, rather Naeraeoides. similar to Acraea (Actinote) thalia and resp. anteas; this (Brazilian) form is acraeoides Hew. (30a), the other Wimimetica. form. mimetica Stgr., from Cayenne, has more yellow ground-colour, but does not differ in the markings. Narunda.

D. larunda Hew. (30 a), from Ecuador, is a mimic of Heliconius. Upper surface black with yellow median band and yellow submarginal spots as well as large red basal spot on the forewing and similarly marked hindwing. The proximal part of the hindwing is beneath red, the broad black border has small white spots and at the distal margin there is a yellow submarginal band.

D. spio Godt. (30 a), from the Antilles, has the forewing sharply falcate in both sexes. In the \mathcal{Q} the yellow-red markings of the 3 are sulphur-yellow.

cubana. D. cubana H.-Sch. (30b), from Cuba, has the forewing only moderately pointed and resembles spio in markings and colouring.

D. lysianax Hew. (30 b), from the Upper Amazon, has the forewing completely rounded. Only the \bigcirc is known, which differs from the \eth of *cubana* by the absence of the yellow subapical spots and further in that the yellow median band is extended to the base in a narrow stripe at the costal margin.

tricolor D. tricolor S. & K. (30 b) resembles Heliconius vicinus Mén. Only the Q is known. Upper surface Rid = black, forewing with a broad yellow median band and red inner-marginal stripe, hindwing with red median band and a yellow-red submarginal spot at the distal margin. Under surface similar, but the red on the hind-Rob = wing reduced to small stripes, and white submarginal spots. Habitat still unknown.

Riob. = Mamphione. D. amphione Cr. (30 b, c), from Guiana, bears a superficial resemblance to certain forms of Heliarsinoc. conius erato. - arsinoe Fldr., from Colombia, differs in the larger and snow-white scent-scale-area on the hindwing; the inner margin of the forewing is red-brown and between submedian and median there is a small black Rustynomides stripe in the red-brown. — In astynomides Star. i. l., from Venezuela, this black stripe is absent and the inner

A curyope.

\$ faesl = hypostieta.

nemesis.

inerascens.

Mª spio.

lysianax.

DISMORPHIA. By J. Röber.

margin itself is very narrowly brown-red and the hindwing only differs from that of arsinoe by the red-brown inner margin. - arsinoides Stgr., from Chiriqui, has the hindwing as in astynomides, but the yellow spots arsinoides. 441 of the central row are smaller and widely separated and the inner margin of the forewing is broadly black. - praxinoe Dbl., from Mexico, differs from arsinoides in that the white scent-scale-area of the hindwing throws praxinoe. All out some teeth into the black distal margin and the colour of the red-brown markings is lighter. — discrepans discrepans. Bur. (30 c), from Colombia and Ecuador, has only very small yellow spots instead of the yellow median band. - meridionalis form. nov., from Bolivia, has only two yellow subapical spots on the forewing and a yellow meridionalis #44 median band, interrupted in the middle but broad, which does not touch the reduced red-brown markings. amphithea Fldr., from Mexico, is larger than amphione and has larger and broader, more falcate forewing. amphithea. 125 Unknown to me, probably not different from praxinoe. — egaena Bates, from Ega, is in the female very dark egaena. All red-brown, has much yellow central and subapical marking and is very similar to Mechanitis polymnia equensis Bates. - rhomboidea Bur., from Nanta (probably East Peru) (or Nauta, Upper Amazon?), is the largest rhomboidea #27 form. In it the yellow subapical spots are entirely absent, the red-brown markings are much developed and in the posterior part of the forewing reach the distal margin, the yellow median band is only represented by some small spots at the costal margin. The φ has red-brown hindwing with black wedge-shaped marginal spots, the vellow median band is very broad and almost reaches the inner angle. Is perhaps a separate species. Only known to me from the figure.

D. laia Godt. Shape and size as amphione. Forewing black with 3 red-brown spots: a long one in laia, the cell, another at the inner margin, and the third, a small round one, is placed towards the middle of the wing and sometimes united with the first; in addition the distal half of the wing is distinguished by a bandlike spot, divided by the veins. Upper surface of the hindwing broadly glossy white along the costal margin, then red-brown with black, dentate, rather broad margin. Under surface of the forewing glossy white, margined with yellow at the apex, the other markings as above, but larger, under surface of the hindwing brownish with several lighter patches, the apex margined with red, a row of rather large yellow marginal spots and 2 small spots of the same colour near the distal margin (at the distal angle). Surinam, Cayenne. Only known to me from the description.

D. astynome Dalm. (= polymela Hbn.) (30 c), from Brazil (Santa Catharina), is very similar to amphione, astynome. but most probably a separate species. Instead of a row of yellow subapical spots astynome has only one such = paulistana spot, occasionally with a dot before it, and this is placed nearer to the apex than the row of spots in amphione. The inner margin of the forewing is always broadly black. The under surface is essentially different. - astyocha astyocha. 430 Hon., from Rio Grande do Sul and São Paulo, differs in the yellow apical spot of the forewing being placed = 9 y. dona R directly at the margin and the under surface being lighter and less marked.

D. dejone Hew. (30 c), from Central America, has the forewing black above with white spots, the anterior dejone. half of the hindwing (scent-spot) light grey, shiny, posterior part of the hindwing red-brown with black margin. Under surface of the hindwing grey-brown with a transverse row of yellow spots in the middle and a few other yellow spots and dots. Q unknown to me.

D. sororna Bilr. (30 d), from Costa Rica and Chiriqui, is a large species. The 3 has black forewing sororna. 1432 with yellowish apical, subapical and central spots, the larger anterior part of the hindwing (scent-spot) is light grey, with silky gloss, the posterior part is red-brown, margined with black. The φ resembles the Lycoreaspecies; it has black forewing with the same rows of spots as the \mathcal{J} , in addition a red-brown transverse band on the proximal half of the forewing, the hindwing is red-brown with black distal margin and some small vellow marginal spots. The under surface resembles the upper. — hagaresa Bilr., from Costa Rica, is pro- hagaresa. 413 bably nothing more than a less marked form of sororna (seasonal form?).

D. cordillera Fldr. (30 d), from Colombia and Chiriqui, though specifically separated by BUTLER from eordillera. 434 sororna, appears really to belong to it as a seasonal form. The yellow spots of the forewing are larger, in the $\vec{\sigma}$ the posterior part of the hindwing is yellow and the φ also has lighter markings, hence the hindwing is almost yellow. The under surface resembles the upper in markings and colouring.

D. orise Bdv. (30 e), from Guiana and Bolivia, but probably also occurring elsewhere, is very similar orise. 135 to Thyridia psidii L. and confusa Bilr., especially in the female. The perfectly transparent wings have black margin and black median band, which, however, in the 3 only reaches the middle of the wing on account of the scent-scale on the anterior half of the hindwing.

D. rhetes Hew., from Colombia, differs from hewitsoni Kirby (30 e, f), from Ecuador, only in the light hewitsoni, spots on the distal part of the forewing and on the hindwing being white (glassy), not bluish. This species bears a general resemblance to several of the larger Ithomiids.

D. theonoe Hew. (30 e), from Ecuador, is very similar to Ithomia flora Cr. It is transparent and has theonoe. $\frac{4}{3}\frac{3}{6}$ black margins and markings. — melanoe Bates, from the Upper Amazon, has broader black margins and bands; melanoe. it is regarded by BATES as a mimic of Ithomia onega Hew.

D. siloe Hew. (30 e), from Colombia, has the posterior half of the hindwing red-brown. It has the general siloe. aspect of an Ithomiid, but is not specially like any particular species.

103

STYX. By J. Röber.

D. theucharila Dbl. (30 f), from Venezuela, also shows a general resemblance to an Ithomiid. The Q

D. lysinoe Hew. (30 d), from the Upper Amazon, is similar to siloe, but has in the male only a broad

D. lysinoides Stgr. (30 f), from West Colombia (Cauca Valley), is only known in the female. It is very

v nella. has the hindwing entirely brown with black markings and broad yellow basal band to the forewing. — nella Bilr., from Colombia, is not different except that the spots of the middle row are not yellow but transparent white. lysinoe. vellow marginal band, which is bordered anteriorly by a black band. sinoides. similar to lysinoe, but has on the underside of the hindwing a complete row of white marginal spots.

ucharila.

D. erythroe Bates (30 f), from the Amazons (S. Paulo de Olivença), is rather similar to Hypoleria aureerythroe. liana, aureola, etc. It is rather variable, the red-yellow apical spot being sometimes divided into several spots, sometimes there is also a red-yellow spot near the inner angle. ^V batesi.

D. batesi spec. nov. (= lysinoe var. Hew.) (30 f), from the Amazons, has not only very much red-yellow marking on the forewing but also a very broad red-yellow band on the hindwing. The transparent parts of the wings are bluish.

14 Leuconoe. D. leuconoe Bates, from the Amazon River (S. Paulo de Olivença), has a larger red-yellow subapical melanoides. spot and yellowish subapical band on the hindwing. The latter is entirely absent in melanoides form. nov. (30 f, g), from Ecuador (Coca), which also has smaller transparent spots on the forewing and somewhat broader black distal margin to the hindwing. This species is very similar to Ithomia ida and ilerdina.

fortunata. D. fortunata Luc. (30g), distributed from Mexico to Chiriqui, has a general Ithomiid-habitus, but Goden Sale, without special resemblance to any particular species. The transparent wings have black margins and bands. The \mathcal{Q} has a whitish transparent subapical band, the \mathcal{J} in its place some entirely glassy spots. — Whether ithomiella form. nov. (30g), from Ecuador (Balzabamba), is a form of fortunata or a separate species I am unable ithomiella. to judge for want of sufficient material. The 3 differs from fortunata-3 in that the glassy median spot of the forewing is broader but shorter and behind it there is another small glassy spot. The Q is very different from fortunata- \mathcal{Q} , as may be seen from the figure. Beneath the 3 has larger white marginal spots, also the \mathcal{Q} has complete rows of larger and rounder white marginal spots, whilst the φ of fortunata has only 3 white dots on the apex of the forewing.

D. antherize Hew. (29 h), from Mexico, is in the male similar to the fortunata- φ , it has no light markings AS antherize. on the distal part of the forewing except a broad white subapical band. On the underside of the hindwing there is a large white apical spot. - In argochloe Bates, from Ega, the margins of the white band of the argochloe. forewing are sinuous, the hindwing is darker and has a submarginal narrow light band.

D. avonia Hew. (29h), from Ecuador (Quito and Balzabamba), has semitransparent yellow markings, avonia. pallida, whilst pallida form. nov. (seasonal form?), from Ecuador (Paramba and Chimbo), has much lighter, glossy markings, entirely white in the distal part of the wing. The under surface is similar to the upper, but both wings bear at the distal margin a row of white spots.

D. pinthaeus L. (= eumelia Cr., vocula Cr.) (29 h), from Guiana, the Amazons, etc., has yellow upper inthaeus. surface with black markings; in the Q there is also a black stripe at the costal margin of the hindwing. The under surface is similar to the upper, but has small white marginal spots and on the hindwing a red-brown Wimelina. submarginal band. The species somewhat resembles the Ithomiid-genus Aeria Hbn. - amelina Hopff. (29h), from Peru, has narrower black bands and consequently larger yellow areas, also the red-brown marginal band ela. on the underside of the hindwing is narrower. - ela Hew., from Ecuador, has in addition small yellowish submarginal spots at the inner margin of the hindwing and the submarginal band of the hindwing is yellow instead of red-brown.

ithomia. D. ithomia Hew. (29h), from Ecuador, is similar to pinthaeus, but by the division of the postmedian yellow band 4 yellow spots are formed on the forewing, also the distal margin of both wings has a complete row of white spots.

D. methymna Godt. (30g), from Brazil (Minas Geraës), is above an exact copy of Heterosais gazoria Godt. (36 d), which flies together with it. Beneath the two species differ in that methymna has white marginal spots on both wings and on the hindwing an indistinct red-brown submarginal band.

36. Genus: Styx Stgr.

As already said, the systematic position of this peculiar genus is altogether uncertain. The idea that Styx infernalis might be the φ of an Erycinid is however incorrect, since the β of infernalis is also known. The external appearance of this insect is Pierid-like, similar to Davidina alticola, which is figured in vol. I, pl. 19b. The neuration of the forewing shows no striking differences, on the other hand that of the costal margin of the hindwing is not unlike certain Ithomiids. In the structure of the palpi and legs the genus shows great similarity to the Erycinids.

S. infernalis Stgr. (30g), from south-eastern Peru (Chanchamayo), is in both sexes transparent greyblack with lighter central part of the wings. Only a few specimens of this species are known, so that it would seem to be very rare or only to occur in a few restricted localities.



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Additions and Corrections. By J. RÖBER.

105

Additions and Corrections.

p. 57: read evonima instead of evonina.

Pieris elodia forma deserta Fruhst., from Ecuador, has on the underside the apex to the forewing deserta. 460 pale straw-coloured and the same colour on the upper surface of the hindwing.

p. 60: *eleusis* belongs to the genus *Leptophobia*. When I worked out the genera *Pieris* and *Leptophobia* I knew *eleusis* only from the description.

p. 62.: Leptophobia gonzaga Fruhst, from Ecuador (Papalacta), captured by R. HAENSCH in the middle gonzaga. of January, is somewhat larger than eleone, hindwing more elliptical, ground-colour white, forewing similar to that of pinara, the costal more extended brown-green, the anal margin powdered with blackish almost to the middle of the wing. The black distal border of the forewing likewise extending at the hindmargin proximally to the middle of the wing, otherwise almost of the same outline as in pinara, especially in the proximal, median incision. At the apex of the cell of the forewing the black band is absent. Hindwing with black diffuse basal area; distal margin yellowish with some black dots at the extremities of the veins. Under surface: forewing whitish; distal border, as far as the black margin of the upperside shows through, suffused with dull yellowish. Hindwing yellowish white, slightly glossy, with small black triangular spot at the end of the cell and yellowish basal area. \mathcal{P} upper surface: forewing broadly margined all round with brown-black, so that the white ground-colour is reduced to a mushroom-shaped discal patch. Hindwing yellowish, costal and anal region defined by a thin black line; the central area bearing 2 black dots. Under surface as in the σ . Fringes in both sexes yellowish. Only known to me from the description.

Lept. eleusis mollitica *Frulest.*, from Peru (Huancabamba), has a more pointed forewing and rounder *mollitica. full* hindwing than *helena*. Upper surface purer white, in the wet-season form distinctly more broadly margined with black than in *helena*. Costal part of the forewing darker, more yellow instead of white. The dryseason form appears to have a narrower border than the dryseason form of *helena*, but of a deeper black.

p. 64: Perch. pyrcha alethina Btlr., from Costa Rica, is in the female similar to the molenka-2; the alethina. ¹⁶⁹ subapical spots are absent, the spots of the median band are sharply yellow, the black spots of the anterior band larger and distinct, the black median band of the hindwing is absent. — Aberration?

p. 65: read antodyca instead of autodyca.

p. 67: Archon. nigripennis has a black forewing and a small red spot on the hindwing; hades Fruhst. appears to be synonymous with it. — In rosacea the three white spots on the forewing are small and well separated, the hindwing has two deep rose-red oval spots. — approximata has the rose-red spot on the hindwing nearer to the distal margin, it is broader, uniform in colour, and divided by three veins. The yellow spot on the under surface is much smaller. Found in the Polochic Valley.

p. 68: Appias peregrina form. nov. (26 c), from Cuba, I consider a form of *janeira Bönningh*. The peregrina, $\frac{1}{2}64$ latter I formerly regarded as an aberrant form of *drusilla* because the author said nothing about the very different shape. It is not necessary here to describe the shape, as it can be seen from the figure. I have - before me two $\sigma\sigma$ of peregrina; in these the upper surface is not glossy white, but strongly yellow, particularly on the hindwing, the proximal part of the costal margin of the forewing is more strongly blackened than in *drusilla* and the black border of the forewing is not extended to the inner angle, but scarcely to the 1. median vein. On the underside the basal half of the cell of the forewing is yellow and the hindwing has a subanal yellowish stripe from the base to the distal margin. — The existence of two American species of *Appias* is consequently established.

p. 71: read teutamis (= epimene Hew.) instead of teutanis. The $\hat{\gamma}$ is black above and has on the forewing a broad red median band, which gives it a resemblance to the red-banded species of Heliconius Instead of troezene Fldr. read affinis Höb. spec nov. (22 d). — Catasticta troezene Fldr., from Colombia, is affinis. #65 above yellow, similar to erimia (22 g), but the wings are smooth-margined, the yellow median markings are troezene. #66 broader and more narrowed anteriorly, in the cell is a comma-shaped yellow spot, hindwing with much broader and not dentate black marginal markings. Under surface similar to tomyris, but the white central markings of the forewing are twice as broad and the dark central markings of the hindwing much broader and pointed distally at the veins.

p. 72: Catasticta incerta Dogn., from Ecuador (Loja), is not really identical with manco; it is, if not incerta. 444 a separate species, at least a good local form of manco. The upper surface is yellower, has much less black marking and large white marginal spots. The ground-colour of the underside of the forewing is much yellower, instead of the small grey triangular marginal spots in manco there are round resp. square yellow spots in incerta, the hindwing has more black marking and deeper yellow spots.

p. 74: Catasticta poujadei Dogn., from Ecuador (Loja), is very similar to clara (22 g), but smaller, poujadei. #60 the uppper surface of the hindwing is almost the same, but the forewing has larger yellow spots, some of which

V

Alphabetical List of the American Pieridae.

are crescent-shaped, and the white, streak-like apical spots are absent, the black distal margin is narrower. In the shape of the wings it agrees more with eximia (22 g).

coloured, both with black apical and distal-marginal markings as far as the third median vein. Hindwing beneath of a beautiful yellow with a red spot at the base, a black spot behind the cell and a row of smoky grey angular spots at the costal margin and apex. Similar to *Hesp. crocea*.

graphites.

Hesperocharis graphites *Bates*, from Guatemala, is large, yellow with black marginal markings and less sharply black submarginal ones, black median spot on the forewing; under surface with much broken black markings and ochre-vellow cell on the forewing.

paranensis. Hesperocharis paranensis *Schaus*, from Parana (Castro), is white with slight greenish tint, distal half of the costal margin narrowly black, small triangular black spots in the apex and at the distal margin of the forewing. Under surface of the forewing whitish, apex and costal margin yellowish, a black dot at the base, antemedian, median and postmedian irregular and angulated black lines, which are interrupted by the veins, small black spots at the distal margin between the veins. A small species.

crocea. Hesperoch. (?) crocea Bates, from Costa Rica and Mexico, is above sulphur-yellow in the σ , deep canary-yellow in the $\hat{\gamma}$, in both sexes slightly dark marked at the apex of the forewing. The under surface is ochre-yellow with the exception of the lighter posterior part of the forewing and has two blackish spots at the costal margin of the hindwing and a similar spot at the point of origin of the 1. median vein. — Apart from the very different facies, which agrees well with *idiotica Bitr.*, crocea also differs somewhat from *Hesperocharis* in neuration, since the upper discocellular of the forewing is absent in the σ and very small in the $\hat{\gamma}$ and the other two discocellulars of the forewing are of very unequal length (lower discocellular longer). It apears to me now, since I have examined specimens which are very probably congeneric with *idiotica*, that the genus *Heliochroma Bitr*. is justified. In shape the species of this genus are very similar to *Daptonoura*, though the hindwing is more elongated at the inner angle, whilst in neuration they more nearly approach *Hesperocharis*.

¹ sinoides. p. 81: **Terias sinoides** Capr., from Rio de Janeiro (Itaipu), is probably a small form of *phiale*. Upper surface white, slightly yellowish, black distal margin of the forewing shorter and narrower than in *phiale*. Hindwing without markings. Under surface with the exception of the posterior part of the forewing more strongly yellow than the upper, in the middle of the hindwing some small blackish spots.

5. **Terias citrina portoricensis** *Dew.*, from Porto Rico, is smaller and lighter than the Cuban form, the violet spots on the under surface are more flesh-coloured.

Terias nigrocincta *Dogn.*, from Ecuador (Loja), is similar to *plataea*, but has a lighter forewing and the hindwing of the same colour. The black border of the inner margin of the forewing is joined to the border of the distal margin, the orange-yellow stripes at the inner margin are absent. The hindwing has large, proximally pointed, well separated black marginal spots. The yellowish under surface has on the hindwing brownish spots and dark scales.

Dismorphia ribbei Godm. & Salv., from Panama, is similar to fortunata, but the subapical band of the forewing is divided and there is a small white apical spot. — Is it a separate species?

Alphabetical List

with reference to the original descriptions of the forms of the American Pieridae.

* signifies that the form is also figured in the place cited.

acadica Pier, Edw. Pap. I, p. 87. acraeoides Dism. Hew. Trans. Ent. Soc. Lond. (2) 1, p. 99. * actinotis Catast. Bir. Cist. Ent I, p. 80. acutipennis Dism. Bir. Entomolog. 1899, p. 26. aelia Dapt. Fidr. Wien. Ent. Mon. V., p. 82. aequatorialis Pseudop. Fidr. Wien. Ent. Mon. V., p. 75. aequatorialis Catast. Rob. Seitz Macrol. 5, p. 71. aesiope Ter. Mén. Cat. Mus. Petr. Lep. I, p. 85. * affinis Catast. Rob. Seitz Macrol. 5, p. 105. * agave Ter. Cr. Pap. Exot. I. * agarithe Catops. Bsd. Spec. Gén. I, p. 623. aida Hesp. Fruist. Soc. Ent. 22, p. 148. alba Col. Weeks. Illustr. of hitherto unfig. Lepid., p. 6. *

alba Col. Röb. Seitz Macrol. 5, p. 94. alba Col. Röb. Seitz Macrol. 5, p. 91. alba Dism. Röb. Seitz Macrol. 5, p. 99. albimaculata Char. Röb. Seitz Macrol. 5, p. 99. albula Ter. Cr. Pap. Exot. 1, * alethina Perth. Bitr. Cist. Ent. 1, p. 81. alexandra Col. Edw. Proc. Ent. Soc. Philad. II, p. 15. * alma Catast. Hopff. Stett. Zg. 1874, p. 330. alticola Col. Godm. & Salv. Equator, p. 107. amalia Dism. Stgr. Exot. Schmett., p. 25. * amarella Dapt. Fruhst. Stett. Zg. 1907, p. 271. amaryllis Pier. F. Ent. Syst. III. 1, p. 189. amathonte Itab. Cr. Pap. Ex. II. *

Mportoricensis.

nigrocincta.

A ribbei.

Aby jaliscana.
amazonica Hesp. Fruhst. Stett. Zg. 1907, p. 262. amazonica Perrh. Fruhst. Stett. Zg. 1907, p. 278. amelina Dism. Hopff. Stett. Zg. 1874, p. 332. amphisone Dism. Cr. Pap. Exot. 111. * amphisas Pier. Fruhst. Soc. Ent. 20, p. 139. amphithea Dism. Fldr. Novara Lep. I, p. 143. ancieps Dapt. Stgr. Verh. zool.bot. Ges. Wien 25, p. 9. andina Col. Stgr. Iris VII, p. 64. anguitia Hesp. Godt. Enc. Meth. IX, p. 146. antarctica Col. Stgr. Hamb. Magalh. Sammeleisa Lepid., p. 23. antherize Dism. Hew. Exot. Butt. II. * antipator Hesp. Druce. Cist. Ent. 1, p. 285. anthrize Dism. *Itel*. Exol. Butt. 11. * anthrize Col. *Hbu*. Zutr. * antipator Hesp. *Druce*. Cist. Ent. 1, p. 285. antodyca Per. *Bsd.* Spec. Gén. I, p. 407. apaturina Catast. *Bttr.* Entomol. 34, p. 302. aphaia Hesp. *Fruhst.* Soc. Ent. 22, p. 148. aphrodite Dism. *Fldr.* Novra Lep. II, p. 139. apicalis Cath. *Fruhst.* Soc. Ent. 22, p. 132. apicalis Cath. *Fruhst.* Soc. Ent. 22, p. 139. approximata Arch. *Bttr.* Cist. Ent I, p. 174. arbela Ter. *Hbn.* Zutr. * arcadia Dism. *Fldr.* Wien. Ent. Mon. VI, p. 410. archidona Arch. *Fruhst.* Soc. Ent. 22, p. 116. arctodice Tat. *Stgr.* Hamb. Magalh. Sammelr. Lepid. 1899, p. 19. argante Catops. *F.* Syst. Ent., p. 470. argyrodice Tat. *Stgr.* Hamb. Magalh. Sammelr. Lepid. 1899, p. 19. ariadne Col. *Edw.* Trans. Amer. Ent. Soc. 1870, p. 11. ariadne Col. *Edw.* Trans. Amer. Ent. Soc. 1870, p. 11. arsinoö Dism. *Fldr.* Novara Lep. II, p. 143. * arsinoides Dism. *Stgr.* Exot. Schmett, p. 25. * arsinoë Dism. Fidr. Novara Lep. II, p. 143. * arsinoë Dism. Stgr. Exot. Schmett, p. 25. * asta Dapt. Frukst. Soc. Ent. 22, p. 178. astyone Dism. Dalm. Anal. Ent., p. 39. astyondies Dism. Rob. Seitz Macrol. 5, p. 102. astyocha Dism. Hon. Zutr. * athalia Ter. Fidr. Novara II, p. 208. atinas Terioc. Hew. Boliv. Butt., p. 4. aureomaculata Math. Dogn. Le Natural. 1887, p. 68. ausonides Euchl. Luc. Rev. Zool. 1852, p. 340. austriana Perrh. Fruhst. Soc. Ent. 22, p. 131. autodice Tat. Hon. Samml. exot. Schmett. (1816—1836). automate Pier. Burn. Desce. Argentin. 5, p. 35. autumnalis Col. Code. West-Amer. Scientist 4, p. 42. avellaneda Catops. H.-Schäfj. Corresp.-Blatt Regensb. XVIII, p. 169. p. 169. avonia Dism. Hew. Trans. Ent. Soc. Lond. (3) 5, p. 563. aymara Lept. Fruhst. Ent. Zeitschr. Stuttg. 22, p. 59. aymara Lept. Franst. Ent. Zeitschr. Stutig. 22, p. 59. beckeri Pier. Edw. Butt. N.-Amer. I. * baitbara Col. H. Edw. Proc. Calif. Acad. VI. bardela Per. Fruhst. Soc. Ent. 22, p. 115. basiliola Pier. Fruhst. Soc. Ent. 22, p. 115. basiliola Pier. Fruhst. Soc. Ent. 22, p. 115. basiliola Pier. Fruhst. Ent. Zeitschr. Stutig. 22, p. 59. batesi Dism. Röb. Seitz Macrol. 5, p. 103. * behrii Col. Edw. Proc. Ent. Soc. Philad. VI, p. 201. bellona Arch. Cr. Pap. Exot. I. * bernardino Megan. Edw. Butt. N.-Amer. 3, p. 71. beryllina Per. Fruhst. Stett. Zg. 1907, p. 284. bianca Dapt. Fruhst. Stett. Zg. 1907, p. 284. bianca Dapt. Fruhst. Soc. Ent. 22, p. 179. bithys Catast. Hön. Zutr. * bogotana Terr. Fldr. Wien. Ent. Mon. VI, p. 84. boisduvalii Catops. Fldr. Wien. Ent. Mon. VI, p. 68. boliviana Catast. Ettr. Ann. Nat. Hist. (6) 17, p. 54. boliviana Lesp. Röb. Seitz Macrol. 5, p. 78. boliviana Hesp. Röb. Seitz Macrol. 5, p. 101. boliviensis Dism. Röb. Seitz Macrol. 5, p. 81. boliviensis Ter. Röb. Seitz Macrol. 5, p. 81. boothii Col. Curt. Ross 2nd Voyage, App. Nat. Hist., p. 65. bryoon Catast. Röb. Seitz Macrol. 5, p. 70. buniae P. Hbn. Samml. Exot. Schmett. * bryoniae P. O. Schmett. Eur. I, 2, p. 151. bryson Catast. Röb. Seitz Macrol. 5, p. 70. buniae P. Hbn. Samml. Exot. Schmett. * butleri Catops. Scudd. Proc. Bost. Soc. XVI, p. 209. caesia Pier. Lue. Rev. Zool. 1852, p. 299. caesia Pier. Luc. Rev. Zool. 1852, p. 299.
calceolaria Ter. Bttr.-Druce. Cist. Ent. I, p. 110.
californiana Col. Mén. Cat. Mus. Petr. Lep. I, p. 80.
callinice Per. Fldr. Wien. Ent. Mon. V, p. 79.

he American Pieridae. 107
callinira Per. Stgr. Exot. Schmett., p. 24.
calydonia Itab. *Bad.* Spec. Gen. I. p. 438.
calymain Dapt. *Flat.* Wien. Ent. Mon. VI, p. 67.
calypso Gon. *Rob.* Seitz Macrol. 5, p. 88.
carmenta Perrb. *Fruhst.* Soc. Ent. 22, p. 131.
carthesis Dism. *Hew.* Trans. Ent. Soc. Lond. 1869, p. 71.
castalia Krie, F. Ent. Syst. III 1, p. 188.
catasticta Hesp. *Rob.* Seitz Macrol. 5, p. 99.
cauce Dism. *Rob.* Seitz Macrol. 5, p. 99.
cauce Argen. *Rob.* Seitz Macrol. 5, p. 10.
cauce Argen. *Rob.* Seitz Macrol. 5, p. 91.
cauce Argen. *Rob.* Seitz Macrol. 5, p. 94.
cerbara Megan. *Stat.* Macrol. 5, p. 11.
centralamericana Megan. *Rob.* Seitz Macrol. 5, p. 94.
cerbara Megan. *Stat.* Natrol. 49, p. 182. *
charopus Itab. *Fruhst.* Stett. Zg. 1907, p. 274.
cheidong Catast. *Hoff.* Stett. Zg. 1907, p. 274.
cheidong Catast. *Hoff.* Stett. Zg. 1907, p. 274.
cheidons Catast. *Hoff.* Stett. Zg. 1907, p. 274.
chilensis Ter. *Bi.* Gay Faun. Chil. VII. p. 17. *
chilensis Ico. *Catr.*. Yosage Cog., 1, p. 28.
chilensis Ter. *Bi.* Gay Faun. Chil. VII. p. 17. *
chilensis Ico. *Catr.*. Yosage Cog. Ap. Nat. Hist., p. 66. *
chippewa Col. *Edv.* Proc. Ent. Soc. Philad. II, p. 79.
christina Col. *Edv.* Proc. Catli. Acad. VI.
chrysonepia Catast. *Koll.* Denkschr. Akad. Wisss. Wien, Math. Nat. Cl. 1, p. 359. *
merascens Dism. Satv. Ann. Mag. Nat. Hist. 7, p. 415.
chinerea Catast. *Koll.* Ann. Mag. Nat. Hist. 7, p. 415.
chinerea Dism. Satv. Ann. Mag. Nat. Hist. 70, 937.
christina Col. *Edv.* Proc. Ent. Soc. Lond. (3). p. 563.
chinia Lept. *Fruhst.* Ent. Zeitschr. Stuttg. 22, p. 59.
chioride Gon. *God.* Enc. Meth. KJ. Suppl., p. 813.
cocana F. *Flat.* Novara Lep. 19. p. 214.
chirode Sim. *Soc.* Ent. 22, p. 147. damaris Ter. Fldr. Novara Lep. II, p. 200.
daulia Dàpt. Fruhst. Soc. Ent. 22, p. 172.
deflorata Ter. Koll. Denkschr. Akad. Wiss. Wien, Math. Nat. Cl. I, p. 863.
deione Dism. Hew. Ent. Nonth. Mag. VI, p. 68.
deila Ter. Cr. Pap. Exot. III. *
demeter Dism. Rob. Seitz Macrol. 5, p. 100. *
demodice Tat. Bl. Gay, Faun. Chil. VII, p. 13.
demodile Itab. L. Syst. Nat. I. 2, p. 761.
deserta Pier. Fruhst. Int. Ent. Zeitschr. 1907, p. 305.
detrita Catast. Rob. Seitz Macrol. 5, p. 73.

deva Ter. Dbl. Gen. Diurn. Lep., p. 78. diana P. Fldr. Wien. Ent. Mon. V. p. 81. digentia P. Fruhst. Soc. Ent. 22, p. 155. digitata Perrh. Fruhst. Stett. Zg. 1907, p. 278. dilis Dism. Bsd. Spec. Gén. I, p. 427. dimera Col. Dbl.Hew. Gen. Diurn. Lep. * dina Per. Bsd. Spec. Gén. I, p. 666. dinora Col. Kg. Trans. Ent. Soc. Lond. 1881, p. 358. discrepans Dism. Btr. Entomolog. 1896, p. 26. disputa Dism. Rob. Seitz Macrol. 5, p. 99. * dismorthing Char. Rob. Seitz Macrol. 5, p. 68. disjuncta Dism. Rob. Seitz Macrol. 5, p. 99. * dismorphina Char. Rob. Seitz Macrol. 5, p. 68. dismorphites Char. Bttr. Cist. Ent. I, p. 80. donis Ter. Rob. Seitz Macrol. 5, p. 82. * doubledayi Lept. Rob. Seitz Macrol. 5, p. 62. drusilla App. Cr. Pap. Exot. II. * drya Catops. F. Spec. Gén. I, p. 616. dysoni Leod. Dbl. Ann. Nat. Hist. 19, p. 385. dyya Catoba, P. Spec. Och. 1, p. 610. dysoni Leod. Dbl. Ann. Nat. Hist. 19, p. 385. ectriva Ter. Btlr. Cist. Ent. I, p. 175. editha Catops. Btr. Trans. Ent. Soc. Lond. 1870, p. 10. edwardsii Col. Edw. Trans. Amer. Ent. Soc. 1870, p. 11. egaena Dism. Bates. Journ. Ent. I, p. 230. eieidias Perth. Hbn. Samml. Exot. Schmett. * ela Dism. Hew. Equat. Lep., p. 82. elathea Ter. Cr. Pap. Exot. Schmett, p. 28. * elatheis Ter. Stgr. Exot. Schmett, p. 28. * elean Lept. Dbl.Hew. Gen. Diurn. Lep. * elethis Lept. Luc. Rev. Zool. 1852, p. 331. elis Col. Sreck. Proc. Acad. Nat. Sc. Philad. 1885, p. 24. elodia Pier. Bsd. Spec. Gén. I, p. 529. elodian Pier. Röb. Seitz Macrol. 5, p. 60. elvina Leuc. Godt. Enc. Méth. IX, p. 138. emeris Catast. Bsd. Spec. Gén. I, p. 408. erinna Lept. Hoff. Stett. Zg. 1874, p. 335. eriphyle Col. Edw. Trans. Amer. Ent. Soc. V, p. 202. erota Hesp. Luc. Rev. Zool. 1852, p. 39. erythroë Dism. Bates. Journ. Ent. I, p. 232. esther Math. Oberth. Bull Ann. Soc. ent. France 1890, p. XX. eubule Catops. L. Syst. Nat. L. 2, p. 764. eucosma Lept. Ersch. Trud. Russk. VIII. t. 3 f. 1. * eugria Catast. Hew. Equat. Lep., p. 78. eurydne Bism. Luc. Rev. Zool. 1852, p. 297. eurydne Math. Hew. Exot. But. I Eut. Zeitschr. 1907, p. 232. eurgiana Catast. Hew. Equat. Lep., p. 78. eurydne Dism. Luc. Rev. Zool. 1852, p. 297. eurydne Math. Movara Lep. II, p. 170. eurydpe Dism. Luc. Rev. Zool. 1852, p. 297. eurytheme Col. Bsd. Ann. Soc. Ent. France 1855, p. 52. eurytheme Col. Bsd. Ann. Soc. Ent. France 1852, p. 286. euterpe Ter. Méth. Butl. Moscou 1832, p. 299. euthinia Pier. Fldr. Wien. Ent. Mon. V, p. 80. euxanthe Col. Fldr. Novara Lep. II, p. 196. evonima Pier. Bad. Spec. Gén. I, p. 498. exigna Leuc. Prittw. Stett. Zg. 1865, p. 133. eximia Catast. Rob. Seitz Macrol. 5, p. 74. * fabiola Ter. Fldr. Wien. Ent. Mon. V, p. 85. folloade Leat. Ervider Ent. Weith. St. 140. 50. 50. 50. 50. fabiola Ter. Fldr. Wien. Ent. Mon. V, p. 85. falledra Lept. Fruhst. Ent. Zeitschr. Stuttg. 92, p. 59. fantasia Krie. Bstr. Trans. Ent. Soc. 1871, p. 170. * flora Dapt. Fruhst. Stettz Ent. Zeitg. 1907, p. 268. flammula Perth. Röb. Seitz Macrol. 5, p. 65. flava Catast. Röb. Seitz Macrol. 5, p. 71. flava Gon. Röb. Seitz Macrol. 5, p. 71. flava Gon. Röb. Seitz Macrol. 5, p. 89. flaveola Col H.-Gay. Faun. Chil. VII, p. 19. * flaveola Col H.-Gay. Faun. Chil. VII, p. 19. * flaveola Col H.-Gay. Faun. Chil. VII, p. 19. * flaveola Hesp. Fruhst. Soc. Ent. 22, p. 148. flavescens Hesp. Röb. Seitz Macrol. 5, p. 79. * flavia Dism. Fldr. Wien. Ent. Mon. V, p. 76. flisa Catast. H.-Schaff. Lep. exot. f. 93, 94. florindensis Catops. Röb. Seitz Macrol. 5, p. 87. florinda Dapt. Bttr. Ann. Nat. Hist. 15(%), 224. foedora Dism. Luc. Rev. Zool. 1852, p. 298. formax Catops. Bttr. Trans. Ent. Soc. Lond. 1871, p. 170. fortunata Dism. Luc. Ann. Soc. Ent. France 1854, p. 55. * frigida P. Scudd. Proc. Bost. Nat. Hist. Soc. VIII. p. 181. fruhstorferi Perch. Röb. Seitz-Macrol. 5, p. 284. (snt)

galatia Dapt. Fruhst. Stett. Zg. 1907, p. 272. gargaphia Dapt. Fruhst. Stett. Zg. 1907, p. 270.

gaugamela Ter. Fldr. Novara Lep., p. 199. * gaujoni Math. Dogn. Le Natural. 1887, p. 189. gerutia Mid. F. Ent. Syst. III. 1, p. 193. gervasia P. Fruhst. Soc. Ent. 22, p. 13. glessaria Perrh. Fruhst. Soc. ent. 20. III, p. 58. glessaria Perrh. Fruhst. Soc. Ent. 22. p. 124. gnathene Per. Bsd. Spec. Gén. I, p. 680. godartiana Catops. Swains. Zool. Illustr. I, * gonzaga Lept. Fruhst. Int. Ent. Zeitschr. 1907, p. 305. graduata Ter. Btlr. Cist. Ent. I, p. 174. grathics Hesp. Bat., Ent. Mo. Mag. 1, p. 32. gratiosa Ter. Dbl.-Hew. Gen. Diurn. Lep. * guatemalena Col. Röb. Seitz Macrol. 5, p. 91. gueneeana Gon. Bsd. Spec. Gén. I, p. 601. gundlachia Ter. Poey. Mem. Cuba, p. 246, * gymnodice Tat. Stgr. Hamb. Magalh. Sammehr. Lep., p. 13. gymnodice Tat. Stgr. Hamb. Magalh. Sammelr. Lep., p. 13. hades Arch. Fruhst. Stett. Zg. 1907, p. 282. hagaresa Dism. Btlr. Cist. Ent. I, p. 82. hageni Col. Edw. Canad. Entomol. 19, p. 218. halnell Ter. Stgr. Exot. Schmett, p. 28. * hartiordii Col. H.Edw. Proc. Calif. Acad. VI. harti Dapt. Btlr. Ann. Nat. Hist. 1896, p. 318. hartonia Catops. Btlr. Trans. Ent. Soc. Lond. 1870, p. 10. hebra Catast. Luc. Rev. Zool. 1852, p. 196. hecabeoides Ter. Mén. Cat. Mus. Petrop. Lep. 1, p. 85. * hecabeoides Ter. Mén. Cat. Mus. Petrop. Lep. 1, p. 85. * hecabeoides Ter. Mén. Cat. Mus. Petrop. Lep. 1, p. 85. * hecabeoides Ter. Mén. Cat. Mus. Petrop. Lep. 1, p. 85. * hecabeoides Ter. Mén. Cat. Mus. Petrop. Lep. 1, p. 85. * hecabeoides Ter. Mén. Cat. Mus. Petrop. Lep. 1, p. 85. * hecabeoides Ter. Mén. Cat. Mus. Petrop. Lep. 1, p. 85. * hecabeoides Ter. Mén. Cat. Mus. Petrop. Lep. 1, p. 85. * hecabeoides Ter. Mén. Cot. 1892, p. 332. helena Lept. Luc. Rev. Zool. 1852, p. 332. helicoides Col. Capr. Ann. Ent. Belgique 17. p. 12. helvia Cath. Latr. Humb. Bonpl. Obs. Zool. II, p. 12. * hersilia Catops. Cr. Pap. Exot. II. * hewitsoni Dism. Ky. Trans. Ent. Soc. Lond. 1881, p. 355. hippotas Dism. Hew. Ent. Month. Mag. 12, p. 10. hirlanda Cath. Stoll. Suppl. Cram. * hollandi App. Rob. Seitz Macrol. 5, p. 68. hopfferi Catast. Rob. Seitz Macrol. 5, p. 71. * huanaco And. Stgr. Iris VII, p. 56. * hubneri Dapt. Btlr. Ann. Nat. Hist. 17, p. 347. Web, hubneri Itab. Fruhst. Stett. Zg. 1907, p. 275. hulda P. Edw. Trans. Amer. Soc. II, p. 300. hyposticta Dism. Hdr. Wien. Ent. Mon. V, p. 77. hypoxanta Dapt. Rob. Seitz Macrol. 5, p. 76. hypnatha Dapt. Rob. Seitz M idiotica Dapt. Btlr. Cist. Ent. I, p. 15. idonia Dism. Hew. Equat. Lep., p. 5. illimani Phul. Weym. Weymer & Maassen, Lep. ges. v. Stübel. idonia Dism. Hew. Equat. Lep., p. 5.
illimani Phul. Weymer & Maassen, Lep. ges. v. Stübel. p. 125. *
immaculata Tat. Röb. Seitz Macrol. 5, p. 57.
imperator P. Ky. Trans. Ent. Soc. Lond. 1881, p. 357.
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imperator P. Ky. Trans. Ent. Soc. Lond. 1881, p. 357.
incerta Catast. Dogn. Le Natural. 1887, p. 189.
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incisa Perrh. Fruhst. Stett. Zg. 1907, p. 278.
ines Dism. Röb. Seitz Macrol. 5, p. 101. *
infernalis Styx. Stgr. Verh. zool-bot. Ges. Wien 1869, p. 465.
innuba Catast. Röb. Seitz Macrol. 5, p. 70.
interior Col. Scudd. Proc. Bost. Nat. Hist. Soc. IX, p. 108.
interimedia Leod. Röb. Seitz Macrol. 5, p. 69.
iole Nath. Bsd. Spec. Gén. I, p. 489.
ipligenia Dapt. Frahst. Stett. Zg. 1907, p. 266.
irren Nath. Fitch. Trans. N.-York State Agric. Soc. 1856, p. 485.
irrigata Catops. Btlr. Trans. Ent. Soc. Lond. 1870, p. 9.
itaicayae P. Foett. Revista Mus. Panlista V, p. 624.
isandra Dapt. Bsd. Spec. Gén. I, p. 490.
isodrita Dism. Bsd. Spec. Gén. I, p. 490.
isodrita Dism. Bsd. Spec. Gén. I, p. 490.
isodrita Dism. Rob. Seitz Macrol. 5, p. 104. *

jacinta Catast. Btlr. Entomol. 34, p. 302. jada Catops. Btlr. Trans. Ent. Soc. Lond. 1870, p. 11. jaegeri Ter. Mén. Cat. Mus. Petrop. Lep. I, p. 84. * jaliscana Hesp. Schaus. Ent. News IX (1898), p. 215. janeira App. Bönningh. Verh. Ver. naturw. Unterh. Hamburg 1896, p. 30. jaresia Catops. Btlr. Trans. Ent. Soc. Lond. 1871, p. 171.

108

jethis Dism. Bsd. Spec. Gén. I, p. 423. joppe P. Bsd. Spec. Gén. I, p. 495. josepha P. Godm. & Salv. Ann. Nat Hist. (4) 2, p. 150. josephina P. Godt. Enc. Méth. IX, p. 158. jucunda Ter. Bsd.-Lec. Lep. Amer. Sept., p. 52. * julia Anth. Edw. Trans. Amer. Ent. Soc. 4, p. 61. jumena Perrh. Fruhst. Stett. Zg. 1907, p. 279. keewaydin Col. Edw. Butt. N.-Amer. Col., t. 4. kiçaha Itab. Reak. Proc. Ent. Soc. Philad. II, p. 349. kleta Dapt. Fruhst. Stett. Zg. 1807, p. 273. krugii Pier. Dew. Stett. Zg. 1877, p. 235 * kieta Dapi. Fruits. Stett. Zg. 1807, p. 273. krugii Pier. Dez. Stett. Zg. 1807, p. 273. krugii Pier. Dez. Stett. Zg. 1877, p. 235 * labradorensis Col. Scudd. Proc. Bost. Nat. Hist. Soc. IX, p. 107. lacordairei Gon. Bsd. Spec. Gén. I, p. 600. lanceolata Mid. Luc. Rev. Zool. 1852, p. 338. laogore Pier. Godm. & Sadz. Biol. C. Amer. 2, p. 184. laria Dapi. Fudr. Novara Lep. H, p. 171. larunda Dapi. Bdr. Ann. Nat. Hist. (4) 18, p. 247. latilimbata Dapi. Bdr. Ann. Nat. Hist. (4) 18, p. 247. latilimbata Dapi. Edr. Ann. Nat. Hist. (4) 18, p. 247. latilimbata Dapi. Bdr. Cast. Ent. I, p. 237. leex Dism. Heze. Equat. Lep., p. 4. lettex Dism. Luc. Rev. Zool. 1852, p. 290. leucatina Hab. Bates. Journ. Ent. I, p. 237. lesbia Col. F. Syst. Ent., p. 477. leonora Dism. Heze. Equat. Lep., p. 7. lewyi Dism. Luc. Rev. Zool. 1852, p. 299. leucatine Dapt. Fldr. Wien. Ent. Mon. VI, p. 67. leucania Hesp. Bsd. Spec. Gén. I, p. 493. leucenthe Dapt. Fldr. Wien. Ent. Mon. V, p. 82. leuce Ther. Bsd. Spec. Gén. I, p. 493. leucothosime Per. Koll. Denkschr. Akad. Wiss. Wien. Math. Nat. Cl. I, p. 358. * leucothea Math. Motina. Hist. Chile I, p. 115. lia Pier. Frukst. Soc. Ent. 23, p. 58. licinia Dism. Cr. Pap. Exot. H. * limbata Dapt. Kor. Man. Nat. Hist. 1857, p. 361.) * * limbata Dapt. Kor. Men. Ent. Mon. V, p. 86. limmoria Dapt. God. Enc. Weth. IX, p. 144. limmoria Dism. Fukr. Novar Lep. H, p. 139. limonea Mid. Btr. Trans. Ent. Soc. Lond. 1871, p. 172. limonea Mid. Btr. Trans. Ent. Soc. Lond. 1871, p. 172. limonea Fer. Fldr. Wien. Ent. Mon. V, p. 81. longicauda Ter. Bades. Ent. Mont. V, p. 81. lougicauda Ter. Bades. Ent. Mont. V, p. 81. lougicauda Ter. Bades. Ent. Mont. V, p. 81. lougicauda Ter. Bades. Stett. Zg. 1907, p. 231. lougicauda Ter. Bades. Stett. Zg. 1907, p. 232. lucasi Perrth. Frukst. Stett. Zg. 1907, p. 239. lucasi Perrth. Frukst. Stett. Zg. 1 macrodice Tat. Stgr. Hamb. Magath. Sammelr. Lepid., p. 21. maeolis Dapt. Fruhst. Stett. Zg. 1907, p. 265. magna Per. Röb. Seitz Macrol. 5, p. 67. malenka Perrh. Hew. Exot. Butt. I Pier. * manco Catast. Dbl. Ann. Nat. Hist. (2) 1, p. 121. mandela Pier. Fidr. Wien. Ent. Mon. V, p. 80. marana Itab. Dbl. Ann. Nat. Hist. 14, p. 421. marcapita Catast. Rob. Seitz Macrol. 5, p. 74. * marchalii Hesp. Guér. Icon. Règne Anim. Ins., p. 468. marginata Leod. Schaus. Proc. U. St. Mus. 24, p. 423.

be American Pieridae. 103
marginella Ter. Fldr. Wien, Ent. Mon. V. p. 97.
marica Dapt. Fruhst. Soc. Ent. 22, p. 172.
marion Dism. Godm. & Salv. Biol. cent. amer. H. p. 184.
marmorata Ter. Dogn. Le Natural. IX, p. 189.
maruorata Ter. Dogn. Le Natural. IX, p. 189.
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maruorata Ter. Dogn. Le Natural. IX, p. 189.
maronia Hesp. Fruhst. Int. Ent. Zeitschr. 1907, p. 231.
maedorina Dism. Hew. Equat. Lep., p. 81.
medorina Ter. Fldr. Wien. Ent. Mon. V, p. 97.
melanoö Dism. Bates. Journ. Ent. I, p. 282.
melanoides Dism. Röb. Seitz Macrol. 5, p. 108. *
melanoides Dism. Röb. Seitz Macrol. 5, p. 108. *
melanoides Dism. Kör. Sust. J. 2, p. 755.
menapia Neoph. Fldr. Wien. Ent. Mon. Y, p. 97.
melanoides Dism. Köb. Seitz Macrol. 5, p. 108. *
melti Dism. L. Syst. Nat. I, 2, p. 755.
menapia Neoph. Fldr. Wien. Ent. Mon. Y, p. 76.
mercenaria Dism. Fldr. Wien. Ent. Mon. Y, p. 76.
mercenaria Dism. Fldr. Wien. Ent. Mon. Y, p. 76.
mercenaria Dism. Fldr. Wien. Ent. Mon. Y, p. 76.
mercenaria Dism. Fldr. Wien. Ent. Mon. Y, p. 76.
mercenaria Dism. Fldr. Wien. Ent. Mon. Y, p. 76.
mercenaria Dism. Fldr. Wien. Ent. Mon. Y, p. 76.
mercenaria Dism. Godt. Enc. Méth. IX, p. 166.
metionalis Dism. Rob. Seitz Macrol. 5, p. 102.
messalina Ter. F. Mant. Ins. H, p. 22.
methymma Dism. Godt. Enc. Méth. Y, p. 166.
metioche Gon. Fruhst. Soc. Ent. 22, p. 148.
minuscula Col. Btr. Trans. Ent. Soc. Lond. 1881, p. 358. *
mininuscula Col. Btr. Trans. Ent. Soc. Lond. 1881, p. 358. *
mininuscula Col. Btr. Trans. Ent. Soc. Lond. 1881, p. 358. *
mininuscula Col. Btr. Trans. Ent. Soc. Lond. 1881, p. 358. *
mininuscula Col. Btr. Trans. Ent. Soc. Lond. 1881, p. 358. *
mininuscula Col. Btr. Trans. Ent. Soc. Lond. 1881, p. 358. *
mininuscula Col. Btr. Trans. Hor. 27, p. 379.
< myrtis Dapt. Fruhst. Soc. Ent. 22, p. 179. napi Pier, L. Faun. Suec., p. 271. napona Dapt. Fruhst. Soc. Ent. 22, p. 178. nastes Col. Bsd. Icones, t. 87. nedra Ter. Godt. Enc. Mcth. IX, p. 135. negrina Arch. Fldr. Wien. Ent. Mon. VI, p. 67. nehemia Pseudop. Bsd. Spec. Gén. I, p. 629. nella Dism. Btdr. Entomologist 29, p. 26. nelphe Ter. Fldr. Verh. zool-bot. Ges. Wien 1869, p. 466. nemesis Dism. Latr. Humb. Bonpl. Obs. Zool. II, p. 78. * neocypris Catops. Hbn. Samml. Exot. Schmett. * nepthhis Lept. Hopff. Stett. Zg. 1874, p. 334. nera Hesp. Hew. Exot. Butt. I Pier. * nereina Hesp. Hopff. Stett. Zg. 1874, p. 336. nereis Hesp. Fldr. Novara Lep. II, p. 146. nicippe Ter. Cr. Pap. Exot. III. * nicipelti Dism. Weym. Iris 1909, p. 26. nigrescens Char. Godm. & Salv. Ann. Mag. Nat. Hist. (4) 2, p. 149. ngreisens on and to data to data. Ann. Indg. Aut. Thist (4), p. 149. nigrointa Ter. Dogn, Le Natural. 1889, p. 134. nilios Hesp. Fruhst. Stett. Zg. 1907, p. 261. nimietes Itab. Fruhst. Stett. Zg. 1907, p. 275. ninguida Cath. Fruhst. Stett. Zg. 1907, p. 275. nibe Catast. Rob. Seitz Macrol. 5, p. 72. * niphates Itab. Fruhst. Stett. Zg. 1907, p. 275. nirvana Hesp. Fruhst. Soc. Ent. 29, p. 154. nise Ter. Cr. Pap. Exol. 1* nisella Ter. Fldr. Verh. zool. bot. Ges. Wien. 12, p. 474. nivifera Gon. Fruhst. Stett. Zg. 1907, p. 294. noctipennis Pier. Btlr.-Druce. Cist. Ent. I, p. 111. p. 149.

110

Alphabetical List of the American Pieridae.

notha Catast. Luc. Rev. Zool. 1852, p. 195. novangliae Pier. Scudd. Bull. Soc. Ent. France. III, p. 57. numatia Per Fruitst. Soc. Ent. 22, p. 116. nympha Phul. Stgr. Iris VII, p. 46. * nymphaea Hesp. Nöstht. Verh. zool. bot. Ges. Wien. 26, p. 296. * nymphagoga Phul. Röb. Seitz Macrol. 5, p. 97. * nymphula Phul. Bl.-Gay. Faun. Chil. VII, p. 14. * nysias Phul. Weym. Weymer & Maassen, Lepid. ges. von Stübel, p. 125. * nysiella Phul. Röb. Seitz Macrol. 5, p. 98. * obnubila Cath. Fruhst. Stett. Zg. 1907, p. 260.
obscurior Catast. Röb. Seitz Macrol. 5, p. 71.
occidentalis Pier. Reak. Proc Ent. Soc. Philad. II, p. 349.
ochracea Lept. Rob. Seitz Gross-Schmett. 5, p. 62.
olantheia Lept. Fruhst. Int. Ent. Zeitschr. 1907, p. 232.
oleracea Pier. Hairis. New Engl. Farmer VIII, p. 402.
olympia Zegr. Edw. Trans. Amer. Ent. Soc. III, p. 266.
ophelia Itab. Fruhst. Int. Ent. Zeitschr. 1907, p. 287.
orbis Catops. Povy. Cent. Lep.
orise Dism. Bsd. Spec. Gén. 1, p. 141.
orthodice Tat. Weymer & Maassen, Lepid. ges. von Stübel, p. 124. *
ostrolenka Perrh. Stgr. Exot. Schmett., p. 36.
othoë Dism. Hew. Trans. Ent. Soc. Lond. (3) 5, p. 562. pacis Terioc. Röb. Seitz Macrol. 5, p. 90. * palaeno Col. L. Faun. Suec., p. 272. palaestra Dapt. Hopff. Stett Zg. 1874, p. 334. pallida Col. Skinner & Mengel. Proc. Acad. Nat. Sc. Philad. palcis Ternoc. Rob. Succ., p. 272.
palaestra Dapt. Hopff. Stett. Zg. 1874, p. 334.
pallida Col. Skinner & Mengel. Proc. Acad. Nat. Sc. Philad.
1892, p. 156.
pallida Math. Rob. Seitz Macrol. 5, p. 104.
pallida Pier. Rob. Seitz Macrol. 5, p. 78. *
pallida Pier. Rob. Seitz Macrol. 5, p. 61.
pallida Pier. Rob. Seitz Macrol. 5, p. 61.
pallida Pier. Rob. Seitz Macrol. 5, p. 64. *
pandora Perth. Rob. Seitz Macrol. 5, p. 64. *
pandora Perth. Rob. Seitz Macrol. 5, p. 64. *
pandora Perth. Rob. Seitz Macrol. 5, p. 73. *
paradoxa Catast. Rob. Seitz Macrol. 5, p. 73. *
paradoxa Catast. Rob. Seitz Macrol. 5, p. 73. *
paradoxa Catast. Rob. Seitz Macrol. 5, p. 75. *
pandoxa Catast. Rob. Seitz Macrol. 5, p. 75. *
paula Dapt. Rob. Seitz Macrol. 5, p. 75. *
paula Per. Rob. Seitz Macrol. 5, p. 75. *
paula Per. Rob. Seitz Macrol. 5, p. 75. *
paula Per. Rob. Seitz Macrol. 5, p. 75. *
paula Per. Rob. Seitz Macrol. 5, p. 105. *
paula Per. Rob. Seitz Macrol. 5, p. 105. *
paula Per. Rob. Seitz Macrol. 5, p. 105. *
petione Col. Bsd. Icon. *
petione Col. Bsd. Soc. Th. 429, p. 133.
persistem Ter. Fruhst. Soc. Ent. 22, p. 133.
persistem Rev. Fruhst. Soc. Ent. 22, p. 133.
persistem Rev. Seitz Macrol. 5, p. 106. *
peruncia Perth. Fruhst. Soc. Ent. 22, p. 135.
peramana Pier. Fruhst. Soc. Ent. 22, p. 136.
peruncia Perth. Fruhst. Soc. Ent. 22, p. 137.
perturiana Dapt. Fruhst. Soc. Ent. 22, p. 138.
persistems Ter. Sett. Za. 1907, p. 269.
peruna Dism. Rob. Seitz Macrol. 5, p. 100. *
peruncia Perth. Fruhst. Soc. Ent. 22, p. 135.
phaloreia Arch. Fruhst. Soc. Ent. 22, p. 136.
phaloreia Arch. Fruhst. Soc. Ent. 22, p. 136.
phaloreia Arch. Fruhst. Soc. Ent. 22, p. 136.
phaloreia Arch. Fruhst. Soc. Ent. 22, p.

phoenicia Ter. Fldr. Novara Lep. II, p. 205. pieris Catast. Hopff. Stett. Zg. 1874. p. 332. pimpla Dism. Hopff. Stett. Zg. 1874, p. 333. pimpla Dism. Hopff. Stett. Zg. 1874, p. 333. pinara Lept. Fldr. Novara Lep. II, p. 179. pinava Catast. Dbl. Ann. Nat. Hist. 19, p. 389. pinthaeus Dism. L. Mus. Ulr., p. 258. pisonis Itab. Hew. Exot. Butt. I. Pier. * pistoris Dant Ferubet. Soc. Ent. 92 p. 178 pinthaeus Dism. L. Mus. Ulr., p. 258.
pistoria Dapt. Fruks. Soc. Ent. 22, p. 178.
pistoria Dapt. Fruks. Soc. Ent. 22, p. 178.
pitana Catast. Fldr. Novara Lep. II, p. 157. *
plata Nath. Dbl.-Hew. Gen. Diurn. Lep. *
plesseni Catast. Röb. Seitz Macrol. 5, p. 70.
plesseni Terioe. Röb. Seitz Macrol. 5, p. 90.
poeyi App. Bthr. Proc. Zool. Soc. Lond. 1872, p. 49.
polyhymnia Dapt. Fldr. Novara Lep. II, p. 170.
pomponia Ter. Hopfi. Stett. Zg. 1874, p. 336.
portoricensis Ter. Dew. Stett. Zg. 1874, p. 336.
portoricensis Ter. Dew. Stett. Zg. 1907, p. 263.
pracelara Cath. Frukst. Stett. Zg. 1907, p. 263.
praxinoë Dism. Dbl. Ann. Mag. Nat. Hist. 16, p. 419.
priddyi Ter. Lathy. Ent. Mo. Mag. (2) 9, p. 223.
princetoria Neoph. Poling. Canad Entomol. 32, p. 358.
prioneris Catast. Hopfi. Stett. Zg. 1874, p. 331.
proserpina Dism. Sm. & Ky. Rhopal. exot. II. *
proterpia Ter. F. Syst. Ent., p. 478.
protodice Pier. Bsd.-Lec. Lep. Amer. Sept., p. 45. *
protadier Disr. Hext. Stett. Zg. 1907, p. 297.
psamathe Dism. F. Syst. Ent. J1, p. 207.
pseudomyrtis Dapt. Fruhst. Soc. Ent. 22, p. 179.
psamathe Dism. F. Syst. Ent. J2, 1907, p. 284.
pyrot Fri. Godt. Ent. Meth. IX, p. 183.
pyrot Fri. Godt. Ent. Meth. IX, p. 183.
pyrot Fri. Godt. Ent. Meth. IX, p. 183.
pyrot Fri. Rod. Ent. Meth. IX, p. 183.
pyrot Fri. Rod. Ent. Meth. IX, p. 184.
pyrot Ter. Godt. Ent. Meth. IX, p. 185.
pyrthoima Tat. Rob. Seitz Macrol. 5, p. 56. *
pyrrhoima Tat. Rob. Seitz Macrol. 5, p. 56. *
pyrrhoithea Col. Hbn. Samml. Exot. Schmett. * radiata Catast. Koll. Denkschr. Akad. Wiss. Wien Math. N. Cl. I. p. 359. *
radiata Dapt. Fruhst. Soc. Ent. 22, p. 179.
rapae Pier. L. Faun. Suec., p. 270.
reakirtii Anth. Edw. Trans. Amer. Ent. Soc. 1869, p. 368.
reducta Catast. Btir. Ann. Mag. Nat. Hist. (6) 17, p. 54.
reducta Per. Rob. Seitz Macrol. 5, p. 66.
regillus Arch. Fruhst. Stett. Zg. 1907, p. 282.
regildas Dapt. Fruhst. Scc. Ent. 22, p. 186.
reticulata Ter. Btir. Proc. Zool. Soc. Lond. 1871, p. 539.
rhetes Dism. Hew. Exot. Butt. II Lep. *
rhomboidea Dism. Btir. Entomolog. 1896, p. 26.
ribbei Dism. Godm. & Salv. Biol. C. Amer. 2, p. 178.
rosa Per. Rob. Seitz Macrol. 5, p. 66.
rosa Zegr. Edw. Pap. II, p. 45.
rosa Zegr. Edw. Seitz Macrol. 5, p. 94.
rosai Col. Gu. Ann. Soc. Ent. France 1864, p. 99.
rubecula Pier. Fruhst. Stett Zg. 1907, p. 280.
rurina Catops. Fldr. Wien. Ent. Mon. V, p. 82. rusella Pier. Fruhst. Soc. Ent. 22, p. 155.
rutilans Col. Bsd. Spee. Gén. I, p. 642. * radiata Catast. Koll. Denkschr. Akad. Wiss. Wien Math. Nat. sabata Itab. Fruhst. Int. Ent. Zeitschr. 1907, p. 287.
sabella Pier. Fruhst. Soc. Ent. 22, p. 155.
sabrina Arch. Fruhst. Soc. Ent. 22, p. 116.
sabrina Per. Fruhst. Soc. Ent. 22, p. 115.
sagittata Tat. Rob. Seitz Maerol. 5, p. 57.
salacia Dapt. Godt. Enc. Méth. IX, p. 144.
salome Ter. Fldr. Wien. Ent. Mon. V, p. 84.
sara Anth. Luc. Rev. Zool. 1852, p. 339.
saturata Col. Rob. Seitz Macrol. 5, p. 94.
scaeva Catast. Rob. Seitz Macrol. 5, p. 94.
scaeva Catast. Rob. Seitz Macrol. 5, p. 73.
schausi Dism. Dogn. Le Natural. 1891, p. 85.
scudderi Col. Reak. Proc. Ent. Soc. Philad. IV, p. 217.
semicaesia Pier. Fldr. Novara Lep. II, p. 176.
seentae Catops. L. Syst. Nat. 1 2, p. 764.
sevata Pier. Fldr. Wien. Ent. Mon. V, p. 81.
sidonia Ter. Fldr. Verh. zool.bot. Ges. Wien 1869, p. 465.
siloë Dism. Hew. Exot. Butt. II Lept. *

theonoë, Dism. Hew. Exot. Butt. I Ent. & Lept. *
therapis Megan. Fldr. Wien. Ent. Mon V, p. 83.
theresa Catast. Bitr. Proc. Zool. Soc. Lond. 1874, p. 358.
thermesia Dism. Godt. Enc. Méth. IX, p. 164.
thermina Dism. Hopff. Stett. Zg. 1874, p. 333.
thetis Gon. Rob. Seitz Macrol. 5, p. 89.
theucharila Dism. Dbl. Ann. Mag. Nat. Hist. (2) 1, p. 123.
theugenis Dism. Dbl. Ann. Nat. Hist. (2) 1, p. 124.
thoosa Anth. Scudd. Bull. U. S. Geol. Surv. IV, p. 257.
thymetus Ter. F. Mant. Ins. II, p. 30.
tiburtia Pier. Fruhst. Soc. Ent. 22, p. 139.
tithoreides Pier. Bitr. Ann. Mag. Nat. Hist. (7) 2, p. 18.
too actast. Dbl. Ann. Nat. Hist. 19, p. 887.
towaria Pier. Fldr. Wien. Ent. Mon. V, p. 80.
tricolor Catast. Bitr. Ann. Nat. Hist. (6) 20, p. 368.
tricolor Dism. Sm. & Ky. Rhopal. exot. 11. *
troezene Catast. Fldr. Novara Lep. II, p. 154. *
troezene Catast. Fldr. Novara Lep. II, p. 154. *
troezenides Catast. Rob. Seitz Macrol. 5, p. 71. * sinapina Catast. Btlr. Ann. Mag. Nat. Hist. (6) 17, p. 54.
sincera Pier. Weym. Weymer & Maassen Lep. ges. a. Stübel R., p. 123.*
sinoë Ter. Godt. Enc. Méth. IX, p. 138.
sinoides Ter. Capr. Ann. Soc. Ent. Belg. 17 (1874), p. 13.*
sisamus Catast. F. Syst. Ent. III 1, p. 44.
siymbrii Pier. Bsd. Ann. Soc. Ent. France 1852, p. 284.
skinneri Col. Barnes. Canad. Entomol. 29, p. 41.
smilačina Ter. Fldr. Novara Lep. II, p. 208.
smithi Lept. Ky, Trans. Ent. Soc. Lond. 1881, p. 357.
socialis Euch. Wezter. Trans. Ent. Soc. Lond. 1, p. 44.
solstitia Catops. Btlr. Ann. Mag. Nat. Hist. (4) 4, p. 203.
sororia Dism. Btlr. Cist. Ent. I, p. 82.
spio Dism. Godt. Enc. Meth. IX, p. 167.
stammata Pier. Luc. Rev. Zool. 1852, p. 330.
stardiussi Col. Rob. Seitz Macrol. 5, p. 91.
statira Catops. Cr. Papil. Exot. II. *
starodice Tat. Stgr. Hamb. Magalh. Sammelr. Lep., p. 18.
stigmadice Tat. Stgr. Hamb. Magalh. Sammelr. Lep., p. 18.
stigmadice Tat. Stgr. Hor. 29, p. 290.
strigosa Catast. Btlr. Ann. Mag. Nat. Hist. (6) 17, p. 54.
streckeri Col. Gr.-Grsh. Hor. 29, p. 290.
strigosa Catast. Btlr. Ann. Mag. Nat. Hist. (6) 17, p. 54.
stygmula Ter. Bsd. Spec. Gén. I, p. 661.
suasa Pier. Bsd. Spec. Gén. I, p. 661.
suasa Pier. Bsd. Spec. Gén. I, p. 549.
suasa as Aler. Btlr. Ann. Mag. Nat. Hist. (7) 2, p. 15.
subflavescens Pier. Btlr. Ann. Mag. Nat. Hist. (7) 2, p. 15.
subflavescens Pier. Ky. Ann. Mag. Nat. Hist. (5) 19, p. 662.
sublavescens Pier. Ryt. Ann. Mag. Nat. Hist. (5) 19, p. 662.
sublavescens Pier. Ryt. Ann. Mag. Nat. Hist. (5) 19, p. 662.
sublavescens Pier. Ryt. Ann. Mag. Nat. Hist. (5) 19, p. 662.
sublavescens Pier. Ryt. Ann. Mag. Nat. Hist. (5) 19, p. 662.
sublavescens Pier. Ryt. Ann. Mag. Nat. Hist. (5) 19, p. 662.
sublineata Pier. Scha sinapina Catast. Btlr. Ann. Mag. Nat. Hist. (6) 17, p. 54. sincera Pier. Weym. Weymer & Maassen Lep. ges. a. Stübel p. 425. subvarians Per. *Röb.* Seitz Macrol, 5, p. 66. sulphurescens Hesp. *Röb.* Seitz Macrol, 5, p. 79. susiana Catast. *Hopff.* Stett. Zg. 1874, p. 331. swainsoni Per. *Gray.* Griff. An. Kingd. XV, p. 674. * sybaris Ter. *Hopff.* Stett. Zg. 1874, p. 337. tagaste Leod. Fldr. Wien. Ent. Mon. III, p. 396. * tamina Catast. Röb. Seitz Macrol. 5, p. 73. Iagiste Leou, Tat. Wien, Ent. Mon. III, p. 386.
tamina Catast. Rob. Seitz Macrol. 5, p. 73.
tegea Ter. Fldr. Novara Lep. II, p. 208.
telasco Catast. Luc. Rev. Zool. 1852, p. 290.
tellane Leod. Hew. Exot. Butt. II Eut. *
tenella Ter. Bsd. Spec. Gén. I, p. 657.
tenuciornis Pier. Bitr.-Druce. Cist. Ent. I, p. 110.
teresa Arch. Godt. Enc. Méth. IX, p. 38.
teresa Dism. Hew. Exot. Butt. II Eut. *
terissa Kric. Luc. Rev. Zool. 1852, p. 429.
terloui Neoph. Behr. Trans. Amer. Ent. Soc. 1869, p. 304.
teutamis Catast. Dbl. Ann. Nat. Hist. 19, p. 386.
thalestris Catops. IV. Mag. J. p. 205.
theano Char. Bsd. Spec. Gén. I, p. 411.
theodes Ter. Fldr. Wien. Ent. Mon. V, p. 85.
theodice Tat. Bsd. Voyage Astrol. Lep., p. 51.
theodora Dapt. Fruhst. Soc. Ent. 22, p. 172.
theona Ter. Fldr. Novara Lep. II, p. 202.

unicolor Per. *Rob.* Seitz Macrol. 5, p. 66. uniplaga Arch. *Fruhst.* Stett. Zg. 1907, p. 281. uricoecheae Catast. *Fldr.* Wien. Ent. Mon. V, p. 78.

valei Pier. Bsd. Spec. Gén. I, p. 494.
vapina Catast. Bttr. Ann. Mag. Nat. Hist. (6) 20, p. 367.
vautieri Col. Guér. Voyage Coqu. *
velia Dapt. Fruhst. Soc. Ent. 22, p. 179.
venosa Pier. Scudd. Proc. Bost. Nat. Hist. Soc. 8, p. 182.
venusta Ter. Bsd. Spec. Gén. I, p. 658.
venustula Ter. Sigr. Verh. zool-bot. Ges. Wien 25, p. 93.
vernalis Pier. Edw. Proc. Bost. Nat. Hist. Soc. 8, p. 182.
venusta Ter. Sigr. Verh. zool-bot. Ges. Wien 25, p. 93.
vernalis Pier. Edw. Proc. Ent. Soc. Philad. II, p. 501.
virginia Pier. Godt. Enc. Méth. IX, p. 141.
virginia Pier. Edw. Trans. Amer. Ent. Soc. 1870, p. 13.
virgo Catops. Bttr. Trans. Ent. Soc. Lond. 1870, p. 9.
virgo Dism. Bates. Ent. Month. Mag. I, p. 5.
viridifascia Dism. Bttr. Cist. Ent. I, p. 88.
viridula Pseudop. Fldr. Wien. Ent. Mon. V, p. 86.
vithel Hesp. Fruhst. Soc. Ent. 22, p. 154.
volkemi Tat. Capr. Ann. Soc. Ent. Belg. 17 (1874), p. 11. *
vulnerata Catast. Bttr. Ann. Mag. Nat. Hist. (6) 20, p. 368.

wallacei Catops. Fldr. Wien. Ent. Mon. VI, p. 68. westwoodi Ter. Bsd. Spec. Gén. I, p. 666.

xanthochlora Ter. Koll. Denkschr. Akad. Wiss. Wien, Math. Nat. Cl. I, p. 363.
xanthodice Tat. Luc. Rev. Zool. 1852, p. 337.
xanthomelas P. Röb. Seitz Macrol. 5, p. 61.
xanthophila Kric. Röb. Seitz Macrol. 5, p. 89.

yolanda Dapt. Fruhst. Stett. Zg. 1907, p. 272.

zaela Dism. Hew. Exot. Butt. II Lept. * zathoë Dism. Hew. Exot. Butt. II Lept. * zenobia Leod. Fldr. Novara Lep. II, p. 146. * zenobina Leod. Hopff. Stett. Zg. 1869, p. 429.





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Pars Il. Fauna americana 1.

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PIERIS-PERRHYBRIS

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Pars II Pauna americana 1

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Pars II. Fauna americana 1

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Pars II. Fauna americana 1.

TERIAS-GONEPTERYX



Pars II. Fauna americana 1.

V.



Pars II. Fauna americana 1.

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CATOPSILIA-MEGANOSTOMA



29 Paura americana 1.

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No. 1. LAW & WEIGHT

Euchloe - Dismorphia



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DISMORPHIA



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DISMORPHIA - STYX



Par II Fauna americana

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DANAIS. By R. Haensch.

3. Family: Danaidae.

Particulars as to the characters of this family are given in the Palaearctic part of this work (vol. I, p. 75). The Danaids are distinguished from the Pierids especially by the aborted forelegs; from the Heliconines, Nymphalids and Satyrids by the basally bifurcate submedian of the forewing. The antennae are thin, without distinct club. Cell of the hindwing long and closed. In America the true Danaids are only represented by a few species of the genus Danais, which belong to the subgroup Anosia and are mostly met with in a large number of individuals in wooded country (especially in North America). In South America on the contrary an externally very different subfamily, the Ithomiinae, is developed in numerous genera and hundreds of species, which are commonest at the tributaries of the Upper Amazon, in the valleys of the Andes, but occur singly as far as Argentina and North America. A third small group, the Lycoreinae, forms the transition between the two beforementioned subfamilies and combines characters of both. Its representatives are most numerous in the central part of America.

1. Subfamily: Danainae.

Wings broad, abdomen short. The scent-organ of the $\vec{\sigma}\vec{\sigma}$ consists of scale-like structures or pouches on the hindwing. The forelegs of the QQ are short, clubbed at the end.

1. Genus: Danais Latr.

Powerful, mostly yellow-brown butterflies with dark margins and whitish dots. They have a longsustained flight and are fond of the open country, accompanying cultivation further and further into the primeval forests as soon as a few clearings have been formed where the foodplants of the larvae, species of Asclepias. can get a foothold. The larvae are bright-coloured, with transverse stripes, and provided with soft appendages. Pupae bell-shaped, with gold ridges or dots.

A. Archippus Group.

Larvae with 2 pairs of fleshy appendages. Cell of the hindwing long. 3 with moderately small scent-spot.

D. archippus F. (= plexippus L.) (vol. I, pl. 28c). Body black-brown, hairy, with whitish dots archippus. and streaks. Wings above brown vellow with dark veins and margins; at the distal margin a double row of small whitish spots. Above the end of the cell of the forewing a black-brown patch with several brownish whitish spots. On the under surface the hindwing is yellowish, the veins with broader edges and the white marginal spots larger. — From Nicaragua southwards occurs a local race which I call nigrippus form. nov. In this the nigrippus. whole apex of the forewing as far as the end of the cell is black-brown and the spots are pure white. This form especially is found also in the north of South America. - HULST designates as fumosus a form of archippus with fumosus. dark black-brown ground-colour. - Larva yellowish with black transverse stripes and has on the 3, and on the 11. segment 1 pair of fleshy appendages. It lives on Asclepias curassavica and requires about 3 weeks for its development. It is protected by its pungent, nauseous smell. Pupa light green, transparent, with golden dots. In North America archippus has as many as four broods. The butterflies of the first appear at the end of May. Sometimes they occur in large swarms. In America the species is found from Canada to Paraguay. The typical northern form, however, extends southwards only to Central America.

D. erippus Cr. (31a) is very nearly allied to archippus, but always differs from it by the absence of erippus. the black-brown inner margin of the forewing. Moreover the veins on the under surface of the hindwing are broadly margined with white. Larva yellowish with black head and transverse stripes. On the 2. and 11. segments 2 appendages each; the anterior ones are used as antennae. Pupa berry-shaped, thickest at segment 6, transparent white-green with shiny gold dots. The habitat of erippus is Brazil from whence it has spread southwards to Patagonia (Berg) and northwards to Central America and the West Indian islands.

D. cleophile Godt. The smallest American species; it differs from all the other forms in having the mar- cleophile. ginal and apical spots yellowish instead of white. The apex of the forewing is broadly black. This rare and beautiful species occurs only on the West Indian islands, particularly Haiti, Cuba and Jamaica.

B. Gilippus Group.

Larvae with 3 pairs of fleshy appendages. Cell of the hindwing short. 3 with moderately large scent-spot.

D. gilippus Cr. (= vincetoxici Hbn., manuja Ersch.) (31a). Similar to erippus, but smaller and with- gilippus. out the black transverse band in the apex of the forewing. Between the median veins of the forewing inside the black margin 4 additional larger, white spots. Further a number of white spots are placed at the end of the cell of the hindwing. Veins in the disc of the hindwing beneath only narrowly edged with white. Abdomen brownish. South America, especially at the coast near Rio de Janeiro, but also in Bolivia. - nivosus Godm. nivosus.

113

114

DANAIS. By R. Haensch.

& Salv. (= hermippus Druce), a form of gilippus, has much paler ground-colour and very large white spots: especially at the apex of the cell of the hindwing; it inhabits northern Peru.

- plexaure. D. plexaure Godt. This small species is very similar to gilippus; but the inner row of white spots, between the median veins of the forewing, is always larger, especially on the under surface. Moreover plexaure has on the hindwing another row of white spots between the black distal margin and the apex of the cell. Further the under surface of the hindwing in *plexaure* is always grey-brown, different from that of the forewing, whilst in gilippus it is red-brown; plexaure occurs in southern Brazil and in Argentina. Larva on Asclepias curassavica; very similar to that of erippus, but with another pair of false thorns on segment 5. The markings also similar to those of erippus; the black is so much extended that the light ground-colour is almost entirely suppressed except for 2 vivid yellow transverse bands. False thorns black, bright red at the base. Pupa likewise similar to that of erippus.
- **D.** berenice Cr. (= erippus F., gilippus Smith) (31a) is the same size as gilippus. Dark brown, the berenice. veins little prominent. The white spots of the forewing are small; on the under surface of the hindwing they are almost entirely absent. Veins on the underside of the hindwing more broadly margined with white on the disc. The double row of small white marginal spots is usually incomplete. From the south of the United States and strigosa, the West Indies to South Brazil. BATES describes as strigosa a form from Guatemala of somewhat lighter colouring, in which the veins, especially on the upperside of the hindwing, are dusted with grey This form also
- thersippus, occurs in Mexico and Texas. ab. thersippus Bat., from Panama, is according to GODMAN and SALVIN an unuhermippus, sual form of berenice. It has dull, dark reddish brown ground-colour and dark brown distal margins. --- hermippus Fldr. (31a) approaches berenice, but is easy to recognise by the strikingly light, grey-brown colour and strongly grey-white dusting in the disc. It has also particularly large white spots on the forewing. It inhabits Colombia. - Larva of berenice on Asclepias curassavica and amplexicaulis. It is whitish violet with red-brown transverse stripes and violet incisions, as well as a yellow lateral line. On segment 2, 5 and 11 is placed 1 pair of appendages. Pupa greenish with black-yellow transverse line on the venter and golden dots. It is more elongate than in archippus without the sharp ventral ridge. The butterflies appear in June. They fly in large numbers in sunny places up to a height of 6000 ft.
- **D.** jamaicensis Bat. Markings as in berenice. Colouring pale yellow-brown with brown margins. The iamaicensis. veins of the hindwing margined with grey as in strigosa. Smaller than berenice. It was once brought in large numbers from Jamaica. Larva with transverse black and white stripes, dorsally with a short yellow band on each segment and yellow spots at the ends of the white stripes above the legs. On segment 5, 6 and 11 is placed 1 pair of red appendages, the first pair the longest. The pupa is light green with very small black dots and golden spots.
- eresimus. **D.** eresimus Cr. (31b). Differs from all the preceding in the relatively small cell of the hindwing, as well as in the absence of the black and white margins on the underside of the hindwing. On the other hand it has here near the dark brown distal margin a lighter broad band and between this and the apex of the cell a second, undulate band, joined to the first at the ends. The colour of the upper surface is brownish, at the base of both wings darker and at the distal margin black-brown. The black-brown costal margin of the forewing is widened behind the apex of the cell into a triangle, the apex of which touches the opposite distal margin, as in erippus; the white marginal and apical spots are likewise present. The abdomen is the same colour as the wings. CRAMER described the species from Surinam; but it also occurs in other parts of northern South America; thus in Colombia, Peru and on the Amazons, though nowhere very common. Is fond of visiting the banks of rivers. - xanthippus Fldr., from Brazil, is said to be most nearly allied to the preceding and to xanthippus. differ from it by lighter colouring, whilst the blackish distal margin of the hindwing is broader and the light spots erginus. on its under surface are absent. - erginus Godm. & Salv. This form is likewise said to approach eresimus and to be distinguished from it by the darker colour of the wings and more distinct white spots. The apex of the forewing is almost black and the disc of the hindwing appreciably lighter. The habitat is northern Peru.
 - D. cleothera Godt. (31b). Very nearly allied to eresimus, but differs especially in the under surface of eleothera. the hindwing, the blackish veins of which, as in most other species, are margined with white. On the other hand cleothera has also the two lighter bands there as in eresimus, and indeed the inner one is still darker and therefore more distinct. The black costal margin is only widened as far as to the discocellular. The hindwing has mostly a double row of white marginal spots on the upper surface. GODART gives (erroneously) the island of Timor as locality of cleothera; it occurs in Mexico, Central America and on the Antilles: according to DOUBLEDAY also in Venezuela.

2. Subfamily; Lycoreïnae.

Wings elongate. Abdomen extending beyond the anal angle of the hindwing; posteriorly thickened like a club. Antennae reaching to the end of the cell. Claws with appendages. \vec{c} with 2 retractile tufts of hair at the extremity of the abdomen. The species of the two genera which belong here are confined to the

LYCOREA. By R. Haensch.

Neotropical region. They occur in open localities in the primeval forest. Their flight is irregular. The larvae are similar to those of the *Danainae*; they are said to live on Solaneae.

2. Genus: Lycorea Dbl. & Hew.

Large. stately, bright-coloured butterflies, mostly of yellow-brown ground-colour, with blackish margins and streaks, as well as yellowish bands and spots and also white marginal dots. The species have all the same scheme of markings, which is also repeated in many genera of the *Ithomiinae*, and of which I will therefore here give a general description, afterwards referring to it for short as *"Lycorea*-habitus". The figure of *Lycorea* halia Hbn. on pl. 31c may serve as an example. The ground-colour is mostly a peculiar reddish yellow-brown. The apical half of the forewing is black-brown with an oblique band formed of yellow spots, which crosses the apex of the cell, and with one or several yellow subapical spots. From the black-brown apical part 3 streaklike projections run towards the base: one along the median, the others along the costal and hindmargin. On the disc of the hindwing there is an oblong, band-like, blackish loop, open towards the base, from the costal margin towards the apex and then back to the inner margin. The oblong space enclosed by this loop is often yellow in a number of species from certain districts. The distal margin of the hindwing is black-brown and mostly has above and beneath a row of white submarginal dots. This scheme of colouring can be recognised again in most Lycoreas and many Ithomiids, though the pattern is often somewhat altered, the yellow being replaced by brown or the black sometimes covering almost the whole hindwing.

The Lycoreas are feeble fliers, prefer the edges of the roads and open places and are fond of visiting flowering shrubs, where, as they hang on the flowers, they can scarcely be distinguished from the similar *Melinaea* and *Mechanitis*.

Unfortunately very little is yet known as to the larvae. BOISDUVAL mentions that they have flexible fleshy appendages, which are arranged in pairs on some of the segments, also that they are similar to those of the true Danaids and likewise live on Asclepiadeae. According to GUPPY some at least of them are similar to those of *Tithorea*, with only 1 pair of appendages on segment 2 and live also on cacao and on a plant similar to caoutchouc.

L. eva F. Markings as in the figured form concolor (31 c), but the forewing has on the discocellular eva. the typical yellow oblique band, which at the costal margin encloses a blackish spot. In eva and the allied forms the cell of the hindwing is only short, as the lower and middle discocellulars form only a very obtuse angle. This form occurs in the north-east of South America, especially Guiana. — The figured local form concolor Stgr. concolor. (31e) differs from the nymotypical form in the absence of the yellow transverse band on the forewing, which also occurs in many Ithomiids, e. g. Hirsutis melanina, Melinaea chincha, Ceratinia bicolora, Mechanitis deceptus, etc. All these forms occur, like concolor, on the eastern slopes of the Andes, in Peru and Ecuador. — pasinuntia Cr. pasinuntia. This form is differentiated from era in that the dark distal margin is merged together with the posterior half of the band-loop into a large spot, as in the figure of ceres. Is found in the same localities as eva, and transitions also occur.

L. ceres Cr. (31c) is distinguished from the similar pasinuntia by the longer cell of the hindwing. Further ceres. the yellow oblique band of the forewing is only half as broad at the costal margin and encloses no black spot there; also the band is not joined to the 4. subapical spot. This form comes chiefly from Guiana. — The variety with typical Lycorea-habitus I call fasciata form. nov. In it the loop and the distal margin of the hindwing are fasciata. separated by the yellow-brown ground-colour, as in eva. Appears to occur especially in the north-west of South America. — demeter Fldr. is a dark brown local form from Cuba and Haiti. It has a yellow macular oblique demeter. L band like halia and 3—4 yellow subapical spots. A similar dark form of fasciata occurs on the Lower Amazon near Manaos. — The larva of ceres is according to GUPPY whitish with black head and segments and oblique, approximated hook-shaped spots. On the 2. segment is placed a pair of long, flexible appendages. In the full-grown larva the colour from the 4. segment onward is yellow. The egg is conical, flattened, yellowish, with numerous cell-like depressions. The larva is hatched in about 5 days.

L. cleobaca Godt. (31b). In this species the yellow transverse band of the forewing is broken up into cleobaca. 3 spots, sometimes also the disc of the hindwing is yellowish. It was described from the Antilles, but is also abundant in the north-west of South America to Bolivia. — In Central America, especially Honduras, it appears mostly in the form **atergatis** *Dbl.* & *Hew.*, in which the yellow subapical spots of the forewing are very large, *atergatis.* the 4. being united with the middle spot of the oblique band. — **pales** *Fldr.*, from the Upper Amazon, has very *pales.* small yellow spots and patches in the blackish apical part of the forewing, and the normally yellow spot at the apex of the cell has assumed the yellow-brown ground-colour. — cinnamomea Weym. is an interesting rare *cinnamomea* form from the Upper Amazon with mahogony-brown ground-colour. The markings are similar to those of *atergatis*, but the yellow subapical spots of the forewing are very large and extend from the apex to the black spot at the end of the cell, which is somewhat larger than in *eva*. Apparently very similar dark red-brown forms occur both of *eva* and of *atergatis*. The first may be recognised by the short cell of the hindwing and 116

ITUNA. By R. Haensch.

the very large, yellow subapical spots of the forewing; in the latter the cell is longer, the subapical spots are smaller and the ground-colour is less reddish.

L. halia Hbn. (31c). This South Brazilian species differs from all the preceding in having only 3 subahalia. pical spots on the forewing and in the yellow longitudinal spot in the disc of the hindwing. This band-like spot is characteristic of many South Brazilian species of Ithomiids and Heliconines, which closely resemble L. halia. such as Hirs. pseudethra Btl., Mel. ethra Godt., Mech. nessaea Hbn., Cerat. euryanassa, Heliconius narcaea Godt., etc., referrens. almost all of which fly together with halia. - As ab. referrens ab. nov. I designate a form in which this bandspot shows the normal yellow-brown ground-colour. — A further form, in which the yellow transverse band of discreta. the forewing is broken up into 3 spots, as in eleobaca, I call discreta form. nov. In this the yellow spot of the hindwing also mostly assumes a brownish shade.

3. Genus: Ituna Dbl. & Hew.

Mostly large, imposing butterflies with transparent, dark-margined wings. The forms are all rather closely allied. Cross vein of the hindwing almost straight and erect. 3 with 2 reversible hair-pencils at the anus, as in Lycorea. Superficially the species are very similar to corresponding forms of Olyras, Thyridia, etc. They are chiefly mountain species. They occur from Central America to South Brazil. The larvae according to BOISDUVAL are similar to those of Lyeorea in shape and habits.

I. lamirus Latr. (= completa Stgr.) (31c). In typical specimens the basal third of the forewing is lamirus. black-brown. But examples commonly occur which have at the base a large semitransparent triangle, which often again is united beyond the median nervure with the spot between the median veins. This form I call ab. fenestrata ab. nov. Both forms vary in the extent of the yellow-brown colour at the distal margin of the hindfenestrata. wing, which sometimes spreads over the whole of the disc. They occur on the eastern slopes of the Andes of Colombia and Ecuador. - On the western slopes of the Andes of Ecuador occurs a local form which is decolorata. markedly distinct by the absence of the yellow-brown colour, and which I call decolorata form. nov. The dark band-marking is otherwise similar to that of *fenestrata*, but weaker, especially the dark subapical band of the forewing is wanting. On the other hand the anal angle of the hindwing is much more broadly blackish. - In Central America occurs the fenestrata-like form albescens Dist. The glassy spots of the forewing are narrow and oblong, and also yellowish brown, especially in the basal half, as is the hindwing except the dark margins and the radial veins. — The pupa of *lamirus* is elongate, with obtuse tip, brownish with longitudinal rows of dark double spots. The butterflies are fond of floating about in open places a few metres above the ground in the sunshine and the 33 drink in the heat of the day at moist places on roads and river banks.

I. phenarete Dbl. & Hew. (31 d), from Peru and Bolivia, is transparently vellowish and closely resembles phenarcte. decolorata. The margins and bands are, however, much more sharply defined, the hindwing at the distal margin lanassa, more sharply dentate, and only the club of the antenna is yellowish. - lanassa Godm. & Salv. is a form of phenarcte with yellow brown inner margin to the forewing and the anal angle of the hindwing of the same colour.

I, ilione Cr. (31d), from South Brazil, is the smallest species of Ituna, and very similar to phenarete. ilione. The yellow club of the antenna is much shorter. The colour of the wings is more vivid yellow, the band over the discocellular of the forewing is broader, and on the under surface the margins and bands are partly edged with white.

3. Subfamily: Ithomiinae.

This group, which is also known under the names Neotropids and Mechanitids, is by far the richest in forms of the Danaids in America. It contains over 9_{10} of all the forms and like the Lyeoreinae is confined to America. Superficially many species recall on the one hand the Lycoreines and on the other the Heliconines, but are differentiated by the neuration, the long, thin antennae and in the 5 very easily by the hair pencil at the costal margin of the hindwing, which in the Lycoreines is placed at the anus and in the Heliconines is generally absent.

Concerning the early stages unfortunately very little is as yet known. The larvae are mostly cylindrical with short tubercles, in some genera with long appendages on segment 2. They are said mostly to live on Solaneae. The pupae, in contrast to the long, thin bodies of the butterflies, are mostly short and stout. They have often brilliantly shining, metallically glossy surfaces, the gloss of which, however, fades after the death of the pupa.

The butterflies have mostly an elongated body, glossy wings and long antennae. The predominant colour of the wings, in addition to the colourless, glassy tone, is a reddish yellow-brown tinge, combined with blackish, yellow and white markings, this being the so-called ,,Lycorea-habitus". Blue, red or green is hardly ever met with. According to the more brilliant or more dull colours the different groups prefer more open places or the dense, dark primeval forest. Their flight is mostly irregular and sluggish. In open, unwooded localities only a few forms are occasionally met with.

albescens.


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117

OLYRAS; EUTRESIS. By R. Haensch.

The area of distribution of the Ithomiids embraces the whole of tropical and subtropical America. Single species occur also in California and in Argentina. 'They also inhabit the mountains up to elevations of 3000 m. Most species, however, are found below the Equator in the valleys of the Andes. Species of the genera *Mechanitis. Ceratinia* and the small transparent *Ithomiinae* especially occur in great abundance. Among them are found singly examples of similar, rare species of the genus *Napeogenes*. Many species have a wide range of distribution and occur. though with slight variations, almost everywhere; others again favour exclusively certain mountain-valleys. One can even sometimes take a few specimens of certain rare species daily in particular localities, although the species is not found elsewhere within a considerable distance.

4. Genus; Olyras Dbl. & Hew.

The few species of this genus are large, semitransparent, mostly rare butterflies. They may be distinguished from similar forms of other genera by the strongly sinuate inner margin of the forewing, especially in the 3, and the broad hindwing with the costal margin correspondingly curved. The 33 have 2 hair-pencils at the costal margin of the hindwing. — They are mountain butterflies, and are fond of floating about in open places mostly at a considerable height above the ground.

0. montagui *Btlr.* (31 d). Forewing dark brown, with irregular, glassy spots in the distal half. Hind-montagui, wing reddish brown with dark distal margin and glassy spot at the apex, which on the under surface is prolonged as a band towards the inner margin (in many examples also on the upper surface). This rather rare species flies on the eastern slopes of the Andes of Colombia and Ecuador; it superficially resembles *Iluna lamirus* and also *Dircenna olyras* and *Napeogenes excelsa*, which occur in the same localities, but are distinctly smaller. — sticheli *Hsch.*, from Eastern Peru, is very similar to the preceding, but is distinguished by a large red-brown *sticheli.* triangle at the base of the forewing. The dark distal margin of the hindwing moreover is broader and the white spots on the under surface are larger. — staudingeri *Godm. & Salv.* (= centralamericana *Stgr. i. l.*), from Central *staudingeri.* America, is similar to the preceding, but has only one yellow-brown streak at the median of the forewing and smaller yellowish vitreous spots. The colour of the hindwing is yellow-brown. In its apex is placed on the upper surface only a small, transparent spot.

0. crathis *Dbl. & Hew.*, from Venezuela, is similar to the preceding, and also to the following. The *crathis*. oblong spot at the base of the forewing is broader, but light yellow-brown. The vitreous spots are smaller and brownish. The hindwing is light brown with broad dark margin and 2 indistinct vitreous spots. — **theon** *Bates theon*. (31d). From Central America; here the vitreous spots are larger, and also the yellow-brown spot at the base of the forewing. Hindwing unicolorous yellow-brown with narrower dark distal margin and light discal spot on the under surface.

0. praestans Godm. & Salv. (31 e) recalls the somewhat larger Ituna phenarete. The forewing is vitreous praestans. with dark margins and oblique bands. The hindwing transparent yellowish with dark costal and distal margins. On the under surface white double spots are placed at the distal margin and 3 white dots at the costal margin of the hindwing. It inhabits north-eastern Colombia. — insignis Salv., from Central America, has red-brown insignis. colour at the anal angle of the hindwing and on the underside only 1 white dot at the costal margin.

0. translucens *Hew.*, from western Ecuador, is the smallest and rarest species. It is almost diaphanous, *translucens*, only at the base slightly yellow, with dark margins and a transverse band on the discocellulars of the forewing to the distal margin. On the under surface small white dots are placed at the distal margin.

5. Genus: Eutresis Dbl. & Hew.

Here also belong only a few forms, of similar size and colouring to *Olyras*, but without the strongly sinuate margins. They likewise inhabit the mountains, from Peru to Central America.

E. hypereia Dbl. & Hew., the first described form and type of the genus, is very similar to the hypereia. figured theope (31e). It is somewhat larger, has broader dark margins and bands, and the base of the forewing and the whole disc of the hindwing are reddish yellow-brown. It flies in the mountains of Venezuela. — hyspa hyspa. Godm. & Salv. (= antioquensis Stgr.) is a local form of hyperia from Ecuador and Colombia, which is distinguished by much weaker red-brown colouring, especially in the disc of the forewing. — imitatrix Stgr. (31e) imitatrix resembles the species of Thyridia and of the transparent Aprotopos. But it is very nearly allied to the preceding and differs chiefly by the absence of the red-brown colour on both wings, as well as by the blackish transverse band across the middle of the hindwing. It occurs on the eastern slopes of the Andes of Peru and Ecuador. theope Godm. & Salv. (= dilucida Stgr.) (31e). This is the Central American form of hypereia, from Costa Rica. theope. It is distinguished especially by the paler margins and the narrower distal margin of the hindwing, which is proximally edged with yellow-brown. © Biodiversity Heritage Library, http://www.biodiversitylibrary.org/; www.zobodat.at

ATHESIS; THYRIDIA; TITHOREA. By R. Haensch.

6. Genus: Athesis Dbl. & Hew.

The species of this genus are similar to the preceding, but mostly considerably smaller. They are distinguished by the angled lower discocellular and the long cell of the hindwing. All are mountain species from the north-west of South America.

- clearista. A. clearista Dbl. & Hew. (31e), from Venezuela, has vitreous wings with dark margins and two oblique bands over the discocellular and across the middle of the cell of the forewing. A streak along the median of the forewing and the veins in the disc of the hindwing are yellow-brown. The long antennae are black.
- acrisione. A. acrisione *Hew.*, a beautiful but rare species from Ecuador, is considerably larger; the apex of the forewing margined with yellow-brown. Across the end of the cell of the hindwing to the inner angle runs a black band, part of which is confluent with the distal margin. In the latter are placed also above large, white submarginal dots.
- dercyllidas. A. dercyllidas Hew. (32a). The wings have the appearance of greenish glass; especially on the under surface the glassy spots are more strongly margined with green. Some of the dark margins and bands on the upperside are bordered with yellow-brown. On the underside they are yellow-brown with dark edges. In the pattern and the greenish colouring the species recalls *Colaenis dido*; it flies in Colombia and Ecuador. demylus. GODMAN and SALVIN designate as **demylus** a form from southern Ecuador with very narrow margins and bands.
- hewilsoni. A. hewilsoni Srnka. This species was figured by HEWITSON as \mathcal{J} to dercyllidas, but recognised by SRNKA as a separate species. It differs in the brownish tone of the hyaline spots and the narrower margins and bands of both wings. In the oblique band across the end of the cell of the forewing is placed towards the distal margin another oblong hyaline spot.
- oligyrtis. A. oligyrtis Hew. is a further form from Ecuador, similar to dercyllidas. It is said to have an in-. distinct band between the discoidal veins before the distal margin of the hindwing, and also 3 white dots at the costal margin; in addition a black band from the apex of the hindwing to the 1. median vein.

7. Genus: Thyridia Hbn.

In this genus, which DOUBLEDAY and HEWITSON call *Methona*, belong only a few larger species with transparent, black-marked wings and thin black antennae provided with stronger, yellow club. The cell of the hindwing is small and closed almost at right angles to the median. The species belong mostly to the plains and occur from Guiana to Argentina and westwards to the Upper Amazon.

- confusa. Th. confusa Btlr. (= psidii Cr.) (32a). This species was long taken for the similar psidii of LINNÉ, which, however, belongs to quite another genus. The latter (pl. 34c) is easy to recognise, in addition to the neuration, by the small reddish dots at the base of the forewing. confusa has transparent yellowish wings with black margins and a transverse band on the discocellular of each wing, as well as a transverse streak through the cell of the forewing. It occurs on the Lower and Uppér Amazon, and in Guiana, in the shady places of banks psamathe, of rivers. psamathe Godm. & Salv., from eastern Ecuador and Peru, is a local form with narrow bands and margins. According to GODMAN and SALVIN there is a corresponding form of Dismorphia orise, whose Q very nearly resembles that of Th. confusa and which occurs in the same localities as psamathe and is said likewise to curvifascia. have narrower bands and margins. curvifascia Weym., from Ecuador and the Upper Amazon, is a form in which the black at the base of the hindwing is extended beyond the point of origin of the I. median vein.
 - themisto. Th. themisto Hbn. (32 a). May be distinguished from the similar confusa by the absence of the broad transverse band on the discocellular of the hindwing. The larva according to W. Müller lives on species of Brunfelsia. It is deep velvety black with orange-coloured belts. The pupa is elongated, immovable, white-yellow with narrow orange-coloured transverse bands and black stripes and spots. The species lives in megisto. central and southern Brazil to Argentina. FELDER describes as megisto a form of the preceding from Bahia, which is said to be larger and to have the veloce lives imagined with black. On the other hand the median band of the forewing is much broader and the distal margin of the hindwing irregular.
- singularis. Th. singularis Stgr., likewise from Bahia, is smaller than themisto and has the inner margin of the hindwing not dentate at the 2. median vein and on the upper surface edged with white. The costal margin of the hindwing beneath is broadly yellow at the base and not interrupted with black on the precostal vein.

S. Genus: Tithorea Dbl. & Hew.

In this genus 2 quite different groups were formerly included and I am compelled to separate the second group under the name of *Hirsutis*. The principal differences are the following: In *Tithorea* the eyes are hairy, the tibiae of the middle and hindlegs are much longer than the femora. The \Im have only 1 hair-tuft at the costal margin of the hindwing. In *Hirsutis* the eyes are naked; the tibiae of the middle and hindlegs are

HIRSUTIS. By R. Haensch.

not much longer than the femora and the 33 have 2 hair-tufts. The species of the genus Tithorea have short broad wings with black ground-colour. They are not at all like the other Ithomiids and recall the Danaisspecies in the shape of the wings. They inhabit the north-west of South America to Panama.

T. humboldti Latr. (= flavomaculata Stgr.) (32 a). A stately, velvety black butterfly with yellow humboldti. macular band across both wings and yellow subapical spots on the forewing. On the under surface the forewing has also yellowish stripes at the base and behind them a double spot. The hindwing has beneath at the base a vellowish streak and a further oblique band, as well as a brown spot outside the cell. In addition both wings bear a row of white submarginal spots. From the Cauca Valley in Colombia, according to LATREILLE also from the Amazons (?). — As albomaculata Hsch. I have designated a form in which the spots on the forewing lata. are white. It appears to be commoner than the typical humboldti, and occurs on the eastern slopes of Ecuador and Colombia at elevations of ca. 1500 m.

T. cassandina Srnka. from Ecuador, is a smaller species, similar to albomaculata. The yellow spots cassandina. of the hindwing are very small, on the contrary the brown spot on the under surface at the end of the cell is very large. The submarginal spots on the underside are bluish white. The species recalls Heliconius cassandra Fldr.

T. bomplandi Guér. (32 b) is the commonest species of the genus. On the upperside the forewing has bomplandi. besides the spots of albomaculata also the white streak and double spot of the underside. The hindwing is marked as in paronii (figured on the upper surface), only proportionately larger. Comes mostly from Colombia, but descanalso from Bolivia. - descandollesi Stgr., from the Cauca Valley in Colombia, is a form in which all the nor- dollesi. mally white spots of the upper surface are yellow. — latreillei Stgr., likewise from the Cauca Valley, has the latreillei. yellow spots like descandollesi, but the band of the hindwing is much broader and behind it follows a further vellow macular band almost as in humboldti. On the under surface the brown spot at the discocellular is much smaller, but continued by 2 smaller spots.

T. regalis Stich. (= dagua Stgr. i. l.) is very similar above to bomplandi, except that the white regalis. spots at the discocellular of the forewing are perceptibly larger. Beneath on the contrary the ground-colour is principally brownish except on the disc of the forewing and the bordering of the white spots and dots. The species comes from the Rio Dagua in Colombia.

T. pavonii Btlr. (32 b) is the smallest species of the genus and above similar to bomplandi. Streak and pavonii. double spot at the base of the forewing are yellowish. On the under surface some of the spots at the end of the cell of the forewing are also yellowish and on the hindwing there are 2 complete rows of brown spots between the rows of white dots and the oblique band. BUTLER describes the species from Panama and compares it with the similar Heliconius peruvianus. But it occurs also in western Ecuador and Peru, as well as in Bolivia. In Ecuador it flies with the confusingly similar *Heliconius atthis* in the same localities.

T. tamasea Hew., from Colombia, has some similarity to descandollesi, but the yellow spots at the base tamasea. and at the end of the cell of the forewing are absent; moreover the yellow band of the hindwing is narrower and abbreviated. On the under surface both wings have whitish marginal dots. The forewing has a brownish band near the median and 2 brownish spots near the apex. The hindwing has further 2 brownish bands at the base and in the disc before the yellow spots. In an aberration from the same locality the band of the hindwing is reduced to 2 spots, of which the distal one is partly brownish. On the under surface almost the whole disc of both wings is brownish. — A further form, which I call lugubris form. nov., has the upper surface lugubris. of the wings unicolorous black-brown, only the minute white double dots in the distal margin of both wings remain. On the under surface there are also a brown subapical band on the forewing and submarginal band on the hindwing. The form comes likewise from Colombia.

9. Genus: Hirsutis gen. nov. .

The distinctive characters of this genus have already been given under Tithorea. It may further be divided into 2 large groups, namely: a) Wings short and broad, patagia black-brown. b) Wings elongate, patagia red-brown. The species of the first group recall Danais and Tithorea by their wing-contour; those of the 2. group have pronounced "Lycorea-habitus". The species are distributed over the whole Neotropical region from Mexico to South Brazil. They are mostly found singly at the edges of the woods or at flowering shrubs with the corresponding species of Melinaea, Mechanitis and Ceratinia.

a) Patagia black-brown.

H. pinthias Godm. & Salv. (32b). A stately butterfly with broad wings. Forewing black-brown with pinthias. 12 irregular yellow spots. Hindwing red-brown with dark costal and distal margins. On the under surface the hindwing has in addition a dark oblique band from the apex to the inner margin, at the beginning of this

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120

HIRSUTIS. By R. Haensch.

band is placed a larger, yellow spot. Both wings have beneath white distal-marginal dots. This form occurs especially in Panama and Costa Rica.

tarricina.
 H. tarricina Hew., from Colombia, is nearly allied to the preceding, but has at the apex of the hind-hecalesina. wing 3 larger, yellow spots. — hecalesina Fldr. (32 c), likewise from Colombia, has towards the dark distal margin of the hindwing proximally a complete band, composed of large yellow spots. Moreover the whole parola. costai margin of the forewing is dark brown as far as the median. — GODMAN and SALVIN designate as parola a form from the Cauca Valley, in which the costal margin of the hindwing is only narrowly black, so that obscurata. the dark spot at the apex stands out distinctly. — On the other hand I call obscurata ab. nov. an aberration from Colombia in which almost the whole hindwing except a spot at the inner angle is black-brown.

bonita. **H. bonita** Hsch. represents the Pinthias-group in eastern Ecuador. In this is placed on the hindwing between apex and discocellular a rounded blackish spot and on the under surface in addition 2 further spots in the disc, which form an oblique band with the subapical spot.

duenna. H. duenna Bates, from Guatemala and Honduras, differs strikingly from the preceding in a blackish oblique band from the apex of the hindwing nearly to the middle of the inner margin, as well as in a reddish, oblong spot at the base of the forewing. Moreover the collar is red-brown. BATES found the species only on monosticta. the tableland of Duenas in Guatemala. — monosticta Godm. & Salv., from Panama and Costa Rica, is said to be distinguished from duenna by the absence of the dark band on the upper surface of the hindwing, but to have a macular band on the under surface.

irene. H. irene Drury, from Jamaica, is a form similar to tarricina, with only 2 yellow spots at the apex of the hindwing and 2 dark spots outside the cell, as well as a red-brown spot at the base of the forewing. — umbratilis. umbratilis Bates, from Panama, differs from the preceding by the absence of the red-brown spot at the base of the forewing and also of the yellow spots at the apex of the hindwing. The antennae are brownish, at the base blackish.

helicaon. H. helicaon Godm. & Salv. has larger, yellow spots on the forewing and 2 red-brown longitudinal spots at the base. The hindwing has narrower margins and no dark spot on the disc. The habitat is Costa Rica.

tagarma. H. tagarma Hew., from Bolivia, is a rare species with somewhat narrower wings, larger yellow spots and large red-brown spot at the base of the forewing. The hindwing is light reddish yellow-brown with naranachoreta. rower dark margin and yellow oblique macular band behind the discocellular. — In the local form anachoreta Thieme, from Peru, the yellow oblique band is shorter and broader, and behind the discocellular of the hindwing is placed an oblong blackish spot. The antennae are black. Collar red-brown.

b) Patagia red-brown.

hippothous. H. hippothous Godm. & Salv. (32 c). This species forms the transition between the two groups. The patagia are still darker brown; the hindwing broad, but with macular longitudinal band and the antennae except at the base yellow-brown. The species differs from *irene Drury* in the two red-brown longitudinal spots at the base of the forewing and the band-like spots in the disc of the hindwing.

hermias. H. hermias Godm. & Salv. Markings as in the figured neitha Hpffr. Colour on the basal half of the forewing and on the hindwing vivid red-brown. The bands and spots in the apex yellow. The black marking of neitha. the hindwing is narrower. This is the form from eastern Ecuador, whilst neitha Hpffr. (32 c), from eastern Peru, is distinguished by the yellow ground-colour of both wings, especially on the under surface. — egaënsis Btlr., egaënsis. from the Upper Amazon, is distinguished from the preceding by the rusty ground-colour of both wings and metanina. by the very small white marginal dots of the under surface. — melanina Hsch. is a form of egaënsis, likewise from the Upper Amazon. It differs in the absence of the yellow colouring and has already been mentioned under Lycorea concolor. — Whilst hermias and the allied forms have all a spear-shaped marking behind the end of the cell of the forewing towards the distal margin, in

hermina.
 H. hermina Hsch. (32 d) the yellow oblique band of the forewing is broken up into about 10 smaller spots. This is a form of hermias from the eastern spurs of the Andes at the River Napo in Ecuador. — A further napona. form from the same localities, napona Hsch., is distinguished by narrower distal margin to the hindwing and the absence of the blackish macular band.

- brunnea. **H. brunnea** Hsch., from eastern Peru, is superficially similar to melannia in the absence of the yellow colouring. In the markings, however, it approximates to napona. It has likewise narrow distal margin to the hindwing and the dark macular band is only feebly indicated.
- *pseudonyma* **H. pseudonyma** Stgr. has similar markings to *hermias*. It may be recognised by having mostly only 3 isolated blackish spots in the disc of the hindwing. The yellow oblique band of the forewing

ATH YRTIS. By R. Haensch.

encloses at the end of the cell only a smaller dark spot and terminates at the distal margin in a more spearshaped point. This species occurs in Bolivia. Paraguay and Argentina. — In southern Brazil occurs the similar **pseudethra** Bilr. (32d), which is distinguished by the characteristic yellow longitudinal band of the hindwing *pseudethra*. and has already been mentioned under Lycorea halia. — I have described as **assimilis** Hsch. the form of *pseudo- assimilis*. *nyma* without yellow colouring, in which it resembles melanina and brunnea. Assimilis is, however, easy to recognise by the 3 isolated spots in the disc of the hindwing. It occurs, like the similar forms, on the Upper Amazon. — As **lateflava** form. nov. I designate yet another form of *pseudonyma* with very broad yellow oblique lateflava. band on the forewing; this band is suddenly narrowed to a small, rounded point close to the distal margin. In it are placed in addition to the spot at the end of the cell 2 small dark dots before the distal margin. This form comes from Santa Cruz in South Bolivia.

H. harmonia Cr. (32 d). In the typical specimens of this species from Guiana the dark longitudinal band harmonia. of the hindwing is confluent with the dark distal margin into a large patch, as in Lycorea ceres and many Ithonniids. The forewing is pointed, especially in the \mathcal{J} . The yellow oblique band ends in three points. — The form with normal Lycorea-habitus and separated bands is **mopsa** F. In this the macular band of the hind-mopsa. wing is narrowed towards the inner margin; ground-colour red-brown. It occurs in Guiana and on the Lower Amazon. — A local form with light yellow-brown ground-colour red-brown. It of this form is black with white dots mcgara. and 2 long, immoveable, antenna-like appendages on the 2. segment. It feeds by day on Echites sp. The eggs are similar to those of Lycorea ceres, yellowish with numerous impressions, and are laid singly on the underside of leaves.

H. cuparina Bates in unknown to me. According to the description it approximates to the following *cuparina*. species (*juria*), as the yellow oblique band of the forewing is said to terminate obtusely. BATES compares it with the common form from the Amazon and says that it is only to be found at the southern tributary of the Middle Amazon, the Tapajos.

In the following forms the longitudinal band of the hindwing is still more distinctly pointed proximally.

H. salvadoris *Stgr.* This large species resembles *hippothous*. It occurs also in Central America (San *salvadoris*. Salvador, Honduras), but has lighter, yellow-brown ground-colour and larger yellow spots. It approaches the following forms in the keel-shaped band of the hindwing.

H. furia Stgr. (32 d) may be distinguished from the similar species by the yellow oblique band of the *furia*. forewing, which terminates obtusely at the distal margin, and by the proximally pointed longitudinal band of the hindwing. It flies in Venezuela and Colombia. — In furina Godm. & Salv. the oblique bands of the forewing *furina*. are broken up into small yellowish spots. It is commoner and more widely distributed than the typical *furia*, occurring in western Ecuador and South Bolivia as well as in Colombia and Venezuela. — flacilla Godm. & Salv., *flacilla*. from the Cauca Valley in Colombia, differs from the preceding in having 3 yellow spots at the apex of the hindwing, which are margined with black; also the base of the forewing is more broadly blackish and the brownish basal streak-spots are correspondingly smaller.

10. Genus: Athyrtis Fldr.

In size and markings the species of this genus are very similar to those of *Melinaea*, but are distinguished at once by the shorter antennae and the angled lower discocellular of the hindwing. (In the figure of *Ath. mechanitis*, pl. 33 a, the neuration is indistinct).

The few forms of this genus are all very rare and occur only on the eastern slopes of the Andes from Colombia to Peru.

A. mechanitis Fldr. (33 a) has the markings almost as in Mechanitis doryssus, but is considerably larger mechanitis. and may be recognised by the angled lower discocellular of the hindwing. The base of the forewing and the hindwing are red-brown; the former with blackish apical half and 3 yellow macular bands, the latter with yellow and black macular band, as well as dark distal margin. Both wings with small white marginal dots. —⁴In the local from oberthueri Srnka, from Ecuador, the yellow longitudinal band of the hindwing is absent, and the oberthueri. bands of the forewing are smaller. — In salvini Srnka, from eastern Peru, the red-brown colour is duller and salvini. extends on the forewing beyond the discocellular. Apex and distal margin are black-brown with yellowish subapical band. At the end and again in the middle of the cell there is a black spot. The bindwing has a central row of 5—6 black spots and narrow, dark distal margin. — In a local form from the Upper Amazon, which I call **amanga** form. nov., the whole apical half of the forewing is black-brown. In this is placed in addition to the amanga. yellowish, very narrow subapical band a brownish band near the end of the cell. Of the two black spots in salvini the distal one is suppressed in the dark apical half.

V

16

MELINAEA. By R. Haensch.

A. distincta Hsch. Similar to mechanitis. The subapical band of the forewing is small, the median distincta. band is proximally curved and encloses a large black spot at the end of the cell; the proximal band consists only of a spot in the cell. The hindwing has on the under surface at the end of the cell a large yellow spot which shows through slightly above.

11. Genus: Melinaea Hbn.

This genus contains numerous stately species of rather large size and mostly of red-brown ground-colour. They may be recognised by the long vellowish antennae and the long cell of the hindwing, with apparently 4-branched median. The Melinaeas are distinguished from the often very similar Mechanitis-species by the normal for legs, which in Mechanitis-33 are reduced to a knob and which in the QQ have 4 joints to the tarsi. Moreover Mechanitis has much shorter antennae. The Heliconius-species, which are likewise often very similar superficially to Melinaea, are recognised by the small cell of the hindwing and the absence of the hair-brushes in the 33. The Melinaea-species are distributed over the whole Neotropical region from Mexico to Argentina, but are mostly not very abundant, occurring singly in company with the corresponding species of Mechanitis and Ceratinia. The 33 have 2 pairs of hair-tufts, of which the first (at the base) is pencil-shaped, the 2. (at the end of the cell) is broad and comb-like.

- M. zaneka Btlr. (= dora Streck.) (32 e). This beautiful, large species is distinguished from most of zaneka the other forms by the absence of the dark longitudinal band in the disc of the hindwing. The forewing shows the Lycorea-habitus, but without the yellow subapical spots. The dark distal margin of the hindwing is narrow and only present in the apical half. The species occurs only in eastern Ecuador, mostly in the dusk of the maculosa, primeval forest on undergrowth. - In ab. maculosa Hsch, the ground-colour is darker red-brown. The hindwing bears in addition one or two incomplete, dark longitudinal bands, as in menophilus. - In a further interesting discurrens. aberration, which I call ab discurrens ab. nov., the ground-colour is likewise darker. At the distal margin of the hindwing are placed large dark brown projections and between the end of the cell and the apex a dark zigzag line runs from the costal to the distal margin.
- menophilus. M. menophilus Hew. (= ishka Btlr.) (32 a). A widely distributed species; it is smaller than zaneka, has a broader, dentate oblique band on the forewing and on the hindwing 2 blackish macular longitudinal bands. eocana. It occurs in the eastern Andes from Colombia to Peru. — In the local form cocana Hsch., from the upper Napo in Ecuador, the two bands of the hindwing are united into a large spot, in which the veins still remain maenius. finely brownish. - In the local form maenius Hew, the ground-colour is dark red-brown and the black bands tarapotensis. and patches are very large, partly comfluent. From the Upper Amazon (Teffé). - As tarapotensis form. nov. (Bang.-H, i. l.) I designate another form with duller ground-colour from Tarapoto on the Upper Amazon. Here the oblique band of the forewing is narrower; the dark bands of the hindwing are larger and diffuse. On the chincha. under surface the dark markings at the costal margin and in the disc of the hindwing are absent. -- chincha Druce is a form of *menophilus* in which the yellow oblique band of the forewing is absent; it has already been mentioned with the similar forms under Lycorea concolor. It comes like these from eastern Peru, and has the black patches exactly as in menophilus.
- messenina M. messenina Fldr. has the appearance of Mechanitis messenoides Fldr. (33 f), the forewing similar to menophilus, the hindwing is however black-brown except for a red-brown subapical spot. In eastern Colombia mothone. and Ecuador. — mothone Hew. (= cydippe Salv.) (32 e). Here the yellow oblique band is absent. The colour consequently appears plain black-brown with broad red-brown oblique band with black spots in it. The following from other genera have very similar markings: Mechanitis deceptus, Ceratinia bicolora and semifulva, Hyposcada fallax, and also Heliconius aristiona and their varieties. mothone occurs on the eastern slopes of the Andes from Colombia to Peru and Bolivia in slightly differing forms.

All the preceding species of Melinaea have a broad black apex to the forewing. The following forms have all a yellow or brownish subapical macular band.

marsaeus. M. marsaeus Hew., from the Amazons, is similar to menophilus, but has a narrower, curved yellow oblique band, which has proximally another spur behind the middle. The black spots at the end of the cell and in the basal part are joined together. In the black apical part are placed 3 oblong red-brown spots.

divisa. M. divisa Stgr. is similar to the preceding in the markings. The yellow oblique band is however suppressed by the red-brown ground-colour. Moreover a yellow macular band is placed in the apex. - In the first described lucifer. lucifer Bates (33 a) the two longitudinal bands of the hindwing are confluent. Both forms occur on the Upper Amazon.

flavosignata M. flavosignata Stgr. (= egesta Godm. & Salv.) has a broader yellow oblique band than menophilus and hicetas, a yellow macular band in the apex. The habitat is Colombia and East Peru. - In hicetas Godm. & Salv. (32 e) the yellow oblique band is suppressed by the red-brown ground-colour. Examples, however, occur like the MELINAEA. By R. Haensch. ,

123

figure, in which some yellow colour is to be seen at the costal margin. - In magnifica Hsch. the subapical spots magnifica. have also become completely red-brown. - orestes Salv. is said to be similar to lucifer, without the yellow spots orestes. at the costal margin and in the apex of the forewing. The hindwing is as in hicetas. - phasiana Btlr. (33 a) phasiana. differs from magnifica in the red-brown, black-margined apex. It is very similar to Mechanitis mazaeus. All these forms come from the Upper Amazon, from eastern Peru. — macaria Godm. & Salv. has the forewing macaria. as in *flavosignata*, except that the two oblong spots at the base are considerably larger. The hindwing has a large black spot as in lucifer and messenina. From North-East Colombia.

M. mneme L. (= crameri Godm. & Salv.) (33 a). has likewise a black-brown spot on the hindwing, which, mneme. however, extends to the costal margin, the base and a subapical spot remain red-brown. The oblique band of the forewing is narrower and in the middle dentate; the spots at the base are rounded. Flies only in Guiana and on the Lower Amazon.

M. mediatrix Weym. (33 b), a superficially very similar, but sharply separated species, occurs on the mediatrix. contrary both on the Upper and Lower Amazon and also in Guiana. The forewing has at the base a pointed double spot, the hindwing at the costal margin a red-brown band. Moreover, the hindwargin of the forewing is broadly black, not so in mneme. - In the form mauensis Weym. the black patch of the hindwing is broken mauensis. up into 2 bands. — In a further form, which I call ab. anina ab. nov., the yellow oblique band of the forewing anina. is broken up into 2 small spots: one at the end of the cell, the other (oblong) in the black apical half at the distal margin. From British Guiana.

M. satevis Dbl. & Hew. (33a) has the markings on the forewing as in mneme, but the ground-colour satevis. is a peculiar wine-red, as is the case in only a few other forms, such as Melinaca madeira and Ceratinia viola. The hindwing is wine-red with dark distal margin and the indication of a longitudinal band in the apex, which is more distinct on the under surface. On the underside the distal margin has small white marginal dots as in mneme. Bolivia.

M. maelus Hew. (= pardalis Bates) has markings and colouring like cydon Godm. & Salv. (33 b), but maelus. eydon. is distinguished by a yellow oblique band across the end of the cell of the forewing nearly to the distal margin, which is absent in cydon. A very similar pattern recurs in Ceratinia castanca and anastasia. All these species fly on the Upper Amazon. HEWITSON describes under maelus another form, which he considers a variety, but which belongs to quite another species. I call it:

M. manga spec. nov. It has a lighter, red-brown ground-colour, a dark apex to the forewing with manga. red-brown spots and 2 very small yellow ones. The basal half and the hindwing are as in marsaeus, except that the median band is stronger and wedge-shaped. From the Amazons.

M. madeira (Star. i. l.) (33 b) has a vellow oblique band like maelus, but this is extended into the cell madeira. and to the 1. median vein. The ground-colour is wine-red, the apex dark. The median band of the hindwing consists of 3 larger oblong spots and 1 small one. This form from the Upper Amazon (Manicoré) appears to be commoner than maelus and cydon.

M. maconis Hew., from the upper Napo in Ecuador, has a pattern similar to that of maclus, but the maconis. whole apical half of the forewing is black-brown except for the narrow transverse band and the 3 large subapical spots. The hindwing has a dark distal margin and a curved macular band, which is connected at the apex with the dark costal margin. - On the Ucayali in Peru occurs a nearly allied form, which I call zamora form. zamora. nor. (Bang-H. i. l.). Here the ground-colour is much lighter, especially before the middle of the wing, and the hindwing is distinguished by a light yellow longitudinal band between the costal margin and the dark median band. The distal margin is only very narrowly edged with dark.

M. mnemopsis Berg (= boliviana Stgr. i. l.) (33d). This species has only the beginning of the yellowish mnemopsis. and dark bands of zamora at the apex of the hindwing. The distal margin is broadly edged with blackish, beneath with distinct white dots. On the forewing the yellow median band is divided into 2 spots. This large form comes from Peru and Bolivia.

M. scylax Salv. (= ribbei Weym.) (33 c), from Costa Rica, has a unicolorous vellow-brown hindwing seylax. with narrow dark distal margin. The forewing has the usual bands and spots with large black spots in the disc.

M. lilis Dbl. & Hew., from Venezuela, and imitata Bates (= tachypetis Fldr.) (33 c), from Central lilis. America and Mexico, are very closely allied. In lilis the median band of the forewing is continuous and brownish; in *imitata* it is yellow and divided Moreover, in *lilis* the central subapical spot is much larger. — In the genus Ceratinia there are likewise 2 very similar forms from Central America and Venezuela: dionaea and fraterna, and again Heliconius telchinia and the allied forms are confusingly similar to the two Melinaeas.

M. ethra Godt. (= phasis Fldr.) (33 d). This typical South Brazilian species may be at once recognised ethra. by the yellow longitudinal band of the hindwing and the isolated yellow subapical spots of the forewing. It has been already mentioned under Lycorea kalia with the similar forms. It especially resembles Heliconius narcaea (= eucrate), with which it flies together.

MECHANITIS. By R. Haensch.

- The small M. thera Fldr. has also a similar pattern, but approximates more nearly to mnasias Hew. (33 d). thera. mnasias, there is the same size as mnasias and has the same markings with the addition of a large white subapical spot on the forewing and small white marginal dots. It has further a yellow longitudinal band on the hindwing like ethra. The typical specimens of mnasias from the Amazons have white marginal dots and 2 larger, yellow spots in the end of the cell and before the oblique band. In the example figured from British Guiana these spots are tecta. absent and the marginal spots are yellow. I consequently call this local form tecta form. nov.
- M. equicola Cr. is very similar to the figured Mechanitis equicoloïdes (33 e). The black spots at the end equicola. of the cell of the forewing and at the distal margin form a band and before this is placed a vellow oblique band. The black spot between the median veins in the disc is absent. On the hindwing the median band and the very broad distal margin are confluent at the inner angle.
- M. idae Fldr. (33 c) is an entirely isolated species from Colombia and Ecuador. The yellow apical idae spots are as in mneme, on the other hand the yellow oblique band is abbreviated and towards the base widened. The hindwing is conspicuous by the absence of the longitudinal band and by the very broad dark distal margin. On the under surface both wings have small white distal-marginal dots. The example figured is from Colombia; the specimens from Ecuador differ in the smaller size and narrower distal margin of the hindwing, which is sharply defined proximally. Ceratinia philetaera and Heliconius clara have similar markings to idae.
- M. paraiya Reak. (33 c). Between the yellow subapical and median band are placed 2 spots in the paraiya. black apical half of the forewing and in the cell two black spots. The hindwing has dark distal margin and a macular band. This common species occurs in Guiana and on the Amazons as well as in Central and South eqina. Brazil; it is very similar to Mechanitis macrinus and also to Heliconius metaphorus. — In the allied egina Cr. the median spots of the band of the hindwing are merged with the distal margin into a large spot. In the forewing
 - there is a third yellow spot between the two median ones. This form flies especially in Guiana and on the Middle Amazon.
- M. messatis Hew. (33d) forms with the two following varieties a small separate group which closely messatis. resembles Heliconius ismenius. Particularly striking are the numerous white spots on the forewing. The median band of the forewing is only developed in the apical half. messatis occurs in Colombia, whilst the nearly allied parallelis. parallelis Btlr. flies in Panama. The latter has a complete longitudinal band on the hindwing. --- dodona Hpffr., dodona. from Bolivia, has on the forewing besides the marginal dots yellow instead of white spots. The hindmargin of the forewing is black, the band of the hindwing complete.

12. Genus: Mechanitis F.

The differences between this genus and the often very similar Melinaea have already been given under the latter. The species are smaller throughout, have long, narrow wings and shorter antennae. In colour and markings the Lycorea-habitus predominates.

This genus has a very wide range; species occur almost everywhere from California to Argentina; many forms, especially in the primeval forests of the plains, occur at times in such enormous numbers as are otherwise attained only by certain colourless Ithomiids. At such times the bushes at particular places are literally covered with them. Mechanitis also produces every possible variety of colouring. Most forms vary so much that one can arrange an almost uninterrupted series of transitions between all the varieties. Many specimens are indeed difficult to place with a definite species, and hybridisation apparently occasionally takes place between nearly allied forms.

M. polymnia L. (33e). Typical examples of this very variable species, with small subapical spot and polymnia. large yellow median band on the forewing, occur especially in Guiana and on the Lower Amazon. The two black spots at the end of the cell are mostly confluent. The median band of the hindwing is broad and dentate. chimborachimborazona Bates is a local form from the western slopes of the Andes in Ecuador, with very broad zona. yellow median band at the costal margin of the forewing, which is suddenly narrowed into a streak behind the cell. The 33 have in the hindwing a very broad black median band; in the 99, however, this is only casabranca, present at the apex. — casabranca Hsch. is the local form from Central and South Brazil, which is easy to recognise by the characteristic yellow longitudinal band in the hindwing. Moreover the yellow subapical spot in the forewing is absent and the double spot at the end of the cell is widened at the costal margin. The median caucaënsis, band of the hindwing is narrow. - I designate as caucaënsis form. nov, the form from the Cauca Valley in Colombia. This is distinguished by dark brown-red ground-colour, large yellow band-spot and small black spots at the end of the cell of the forewing. The black spot in the cell is produced into a point. The broad median band of the hindwing in the \mathcal{J} is almost edentate.

canicoloïdes. M. equicoloïdes Godm. & Salv. (33 e). This and the following form differ from all the others in the larger size and more powerful build. But the marking is similar to that of doryssus. Very striking are 2 black, isolated spots at the costal margin of the hindwing. Whilst the form equicoloides from the Upper Amazon

MECHANITIS. By R. Haensch.

125

has on the hindwing the usual pattern with black, dentate longitudinal band and similar distal margin, in the allied **sylvanoides** Godm. & Salv., from Guiana, the two bands are confluent at the inner margin. The *sylvanoides*. latter form is said to resemble *Heliconius sylvana*.

M. pannifera Bilr. (= plagifera Stgr.) (33e). Here the median band and the distal margin of the hind- pannifera. wing are merged into a black patch as in Melinaea cocana The costal margin and apex remain red-brown. The yellow oblique band of the forewing is narrower than in polymnia, at the apex there is mostly a yellowish spot. This form occurs both on the Amazons and in Guiana and Venezuela.

In M. messenoides Fldr. (83 f) the black patch of the hindwing also occupies the whole costal margin, messenoides. moreover the base of the forewing is also black, and the yellow subapical spot is absent. This species corresponds exactly to Melinaea messenina. On the eastern slopes of the Andes, from Colombia to Peru. — Just as in the Melinaea messenina. On the eastern slopes of the Andes, from Colombia to Peru. — Just as in the Melinaea messenina. On the eastern slopes of the Andes, from Colombia to Peru. — Just as in the Melinaea messenina. On the eastern slopes of the Andes, from Colombia to Peru. — Just as in the Melinaea messenina. On the eastern slopes of the Andes, from Colombia to Peru. — Just as in the Melinaea messenina. On the eastern slopes of the Andes, from Colombia to Peru. — Just as in the Melinaea there is also in the Meduanitis a form without the yellow oblique band of the forewing, namely deceptus Btlr. (= mothone Salv.). This is deceptively similar to Melinaea motione. It occurs on deceptus. the Upper Amazon, a form which is otherwise marked like deceptus, there are 2 more round yellow spots at the distal margin of the forewing. — In **migroapicalis** Hscl. the base of the forewing and the costal margin of the hindwing are red-brown. In many specimens the median band of the hindwing and the distal margin are completely separated. — **mazaeus** Hew. (34 a) has in addition a red-brown patch in the apex of the forewing. mazaeus. — In **phasianita** Hscl. this subapical spot is very large and the black marking in the apex is considerably phasianita. less extended, so that this form has much the appearance of Melinaea phasiana. It occurs like mazaeus on the Upper Amazon and its tributaries in Peru and Ecuador. — **lucifera** Hsch. again forms a transition to the lucifera. forms with yellow oblique band and subapical spot. The marking is as in phasianita, but the subapical spot and the oblique band are yellow, with brownish margin. This form, which may be recognised by the strikingly large subapical spot,

M. visenda *Bilr*. has a narrower, yellow oblique band on the forewing, which does not reach to the *visenda*. end of the cell; on the other hand broader, black bands at the inner margin of the forewing and in the disc of the hindwing, as well as narrow distal margin to the hindwing. It flies on the Lower Amazon and Tapajos.

M. fallax *Btlr.*, from Colombia, has likewise a narrower, yellow oblique band and small black spots *fallax*. at the discocellular of the forewing, as in *messenoides Fldr*. The costal margin and apex of the hindwing are red-brown. The black median band is confluent with the distal margin.

M. egaënsis Btlr. (34 a), from Ega on the Upper Amazon, has dark red-brown ground-colour. The egaënsis. oblique band is large and one half of it brownish. The black spot at the base is large and wedge-shaped. The hindwing has broad median bands and strongly dentate dark distal margin. — obscura Btlr. is a very dark obscura. form of egaënsis with broader black bands and occurs at the same localities. — In plagigera Btlr. the black plagigera. bands and patches are much narrower than in egaënsis; the subapical spot is smaller and yellow, like the more elongated band of the forewing. From Prainha on the Amazon.

M. truncata *Btlr.* belongs to a small group with shorter wings, in which the apex of the hindwing *truncata*. is almost truncate. It has a pattern like *egaënsis*. The wings are red-brown, the black streak at the inner margin of the forewing is long. In the apex of the forewing is placed a large yellow spot with brown margins. The form varies very much and flies together with *egaënsis* and *obscura* near Ega. — juntana *Hsch.* (34 a) has *juntana*. a very narrow, strongly dentate yellow band on the forewing, a similar black median band and very narrow margin to the hindwing. The ground-colour is light yellow-brown. The form flies in eastern Ecuador and Peru, at the base of the Andes. It is at times very common at flowering shrubs. — A nearly allied form is **huallaga** *Stgr.* (34 a), from eastern Peru. It bears, however, a greater resemblance to *phasianita* and *olicencia huallaga*. It is easy to recognise by the narrow distal border of the hindwing. — The similar **olivencia** *Bates* has broader, *olivencia*. black bands and patches, as well as a yellow spot at the discocellular of the forewing. It occurs likewise *juri-maguënsis Styr.* has lighter, red-brown ground-colour than *olivencia* and the *juri-maguënsis*. and sometimes confluent with the broad distal margin.

M. proceris Weym. This small species has the appearance of *juntana*. It may, however, be recog- *proceris*. nised by the black distal margin of the hindwing being broader and the black streak at the inner margin of the forewing terminating obtusely. From Tonantins on the Upper Amazon.

With **M. doryssus** Bates (33 f) we pass to another group of forms which are distinguished by long, narrow *doryssus*, wings and mostly inhabit Central America or the adjoining north-west of South America. They have mostly

MECHANITIS. By R. Haensch.

a similar pattern as in the preceding forms, i. e. on the forewing doryssus has in the black apical half an undulate yellow oblique band and a subapical spot. The basal half of the forewing and the hindwing are red-brown; the former with 2 black spots and black margins, the latter with narrow median band and distal margin. utenaia. In Central America, from Costa Rica to Honduras. — REAKIRT designates as utenaia a form from Honduras veritabilis, in which the oblique band of the hindwing is broken up into 2 spots. - veritabilis Bilr. is the form from Colombia and Venezuela, with narrow wings. Here the club of the antenna is yellow-brown, in doryssus only saturata, the base is dark. The ground-colour of the wings is darker. This form flies also on Trinidad. - saturata Godm. & Salv. is a similar, larger form from Mexico with very narrow yellow bands in the forewing, broader black labotas, apex and large basal spots. - labotas Dist, is a very light form from the volcano Chiriqui with yellow colour at the end of the cell of the forewing and partly also at the base of the hindwing. Especially striking is the \mathcal{Q} of this local form, in which the black median band of the hindwing is only indicated at the apex, and is sometimes entirely absent.

M. lycidice Bates (34 a). Smaller than doryssus. The forewing black with 3 yellow oblique bands, lycidice. and also red-brown base and 2 red-brown spots at the inner angle. The hindwing has broader, black median band and before it an indistinct yellow longitudinal band. In the \mathfrak{P} the black band is proximally incomplete. curudice. In Central America, from Costa Rica to Honduras. - eurydice Hsch. is a similar form from Pern. The black marking in the disc of the forewing is reduced. The yellow subapical spot is prolonged into a band. The median band is narrower and more strongly dentate. The hindwing has a broad yellow longitudinal band and in the Q also the black macular band is complete. Antenna yellow-brown with dark base, in lycidice dark dorussides, with yellowish club. — doryssides Stgr. is very similar to the preceding, but has no yellow longitudinal band ocata, in the hindwing and the spots in the disc of the forewing are brownish yellow. - ovata Dist., from Costa Rica, has broader and more roundish wings than lycidice. The macular bands of the forewing are narrower. The black longitudinal band of the hindwing is only present in the apex and the yellow marking before it is entirely isthmia, absent. - In isthmia Bates (34b), from Panama and Costa Rica, the black colour occupies almost the whole of the forewing. The yellow median band is broken up into 2 spots. The black median band of the hindwing is very broad; yellow colour is absent. In the φ the median band is only indicated by a spot before arcana, the apex. - In a form from Honduras, which I call arcana form, nov., the hindwing has a broad yellow longicalifornica, tudinal band and also in the Q a complete black band behind it. — californica Reak. In this form from California the vellow spot on the discocellular of the forewing is said to be much narrower than in *isthmia*; behind the end of the cell a yellow band runs from the costal to the hindmargin.

M. mantineus Hew. (34c) is a species very different from the preceding forms, which is distinguished mantineus. by the almost complete absence of red-brown, even on the hindwing, and by the absence of the yellow subapical spot in the forewing. The forewing has only one red-brown spot at the inner angle and the hindwing a fine redbrown line before the distal margin. In addition to the yellow median line the forewing has 2 yellow spots and a streak on the median vein. The hindwing has a yellow longitudinal band. This interesting species, which recalls Heliconius nattereri, occurs only on the western slopes of the Andes in Ecuador, but is not rare.

M. franis Reak. (33 f) and the two following forms are nearly allied to polymnia caucaënsis. The groundfranis. colour of franis is reddish yellow-brown. The large yellow median spot in caucaënsis is here separated by peruana, a black macular band into 2 parts, of which the proximal one is partly yellow-brown. — In the form peruana Weym, the median band of the forewing is confluent with the distal margin; hence there remains of the yellowbrown ground-colour only a longitudinal band pointed towards the apex in the otherwise black-brown wing. - In the form menapis Hew. (33 f) the black colour is still further increased, so that often only 2 small redbrown spots at the base of each wing remain. Almost all transitions between the 3 forms are found. They fly in Colombia, especially in the Cauca Valley.

M. clisa Guér. has the forewing similar to that of isthmia; the two yellow spots at the end of the cell elisa. of the forewing (the remains of the oblique band) are here still further reduced and are placed near to the costal resp. distal margin. On the other hand the two spots in the disc are enlarged. The zigzag band of the hindwing and the distal-marginal band are narrow. On the Upper Amazon and its tributaries in Ecuador, Peru and Bolivia. - menecles Hew. is a form from the Amazon with small yellow spots in the forewing and a menecles. small red-brown spot below the yellow one near the inner angle. The hindwing has only the beginning of the ocona, median band in the apical area. — In ocona Druce (= vilcanota Röb.) (34b) the ground-colour in the 3 is lighter yellow-brown. The yellow spots and the costal margin of the hindwing are semitransparent. Between the two oblong yellow spots at the end of the cell and the distal margin is placed another oblong yellow spot, so that here the usual oblique band is restored. The typical specimens come from the Upper Amazon, from Peru. At the Upper Napo in Ecuador the form is similar to elisa, except that in the forewing the yellow double spot of ocona is still present.

In the following forms the two proximal yellow spots of the forewing are united into a broad oblique band; the median band is only indicated by a few dots or is entirely absent.

menanis.

APROTOPOS; CALLITHOMIA. By R. Hacnsch.

M. macrinus Hew, $(= \varphi$ numerianus Fldr.) (34 b) has mostly 3 oblong yellow spots in the black apical macrinus. third of the forewing as a remnant of the oblique band at the end of the cell. Between the median and its first branch is generally placed another, triangular black spot, especially in the β . The latter has moreover in the disc of the hindwing above a black longitudinal band, which is indicated beneath and in the φ only at the apex, or the black band is entirely absent beneath also. This species is deceptively similar to *Heliconius* metaphorus, with which it also occurs together. The examples from Colombia are distinguished by large black spots in the basal part of the forewing and broad black longitudinal band on the hindwing; those from Panama and Costa Rica have narrower wings, spots and bands. The specimens from Ecuador on the other hand have a bright vellow oblique band and small vellow spots in the forewing; the black spot at the median is mostly absent.

M. nessaea Hbn. (34 b) differs from macrinus in the yellow longitudinal band of the hindwing and the nessaea. two vellow dots at the end of the cell and the distal margin of the forewing. The species is especially common in Central Brazil. — sulphurescens Hsch., from Bahia in Brazil, forms the transition to the following subspecies. It differs from nessaea in the absence of the two yellow median dots; from lysimnia in the yellow instead of white subapical spot. - lysimnia F. (34b) is distinguished from nessaea by the white subapical lysimnia. spot and the absence of the vellow median dots in the forewing. - In ab. albescens Hsch. there is a white tri- albescens. angular spot at the distal margin of the forewing and on the under surface the subapical spot is surrounded by a white macular band, which shows through above. — The larva of *lysimnia* is blue-grey with white tubercles and black stigmata. Pupa shiny gold-yellow, with a silver gloss on the ventral side, and with black dots and lines. - lysimnia is one of the commonest species of Mechanitis and flies principally in Central and South Brazil.

13. Genus: Aprotopos Kirby.

Aprotopos is distinguished from the very similar Thyridia, as Mcchanitis from Melinaea, by the aborted forelegs, from Mechanitis by the shorter cell. The species of this genus may be recognised superficially by 1-2 red-brown dots at the base of the forewing.

The few species have mostly a wide distribution, but are almost everywhere only taken singly.

A. melantho Bates (34 c). This Central American species differs from all the others in the intense colouring melantho. of the wings. The normally vitreous spots of the forewing are almost entirely covered with black. The hindwing is dark red-brown with black distal margin and spot at the end of the cell. — In a form from the volcano Chiriqui, which I call randolis form. nov., the whole apex of the hindwing as far as the end of the cell randolis. is black-brown except for a small red-brown streak.

A. aedesia Dbl. & Hew. (34 c) has the same scheme of markings as melantho, but the vitreous spots aedesia. of the forewing are much larger and especially at the base vellow-brown. The disc of the hindwing is likewise light yellow-brown, not so red-brown as in the figure. The black spot at the end of the cell is connected with the costal margin. Especially in Colombia and Venezuela.

A. ceto Fldr. (= colombiana Godm. & Salv.). This rare species has the markings as in psidii, on ceto. the other hand a brownish ground-colour similar to acdesia. Colombia.

A. psidii L. (34c). The similarity of this species to Thyridia confusa has been already mentioned under psidii. the latter. It occurs in Guiana and on the Lower and Upper Amazon, to the Andes of Peru and Ecuador. Specimens from the first named districts have broader black margins and bands; those from Ecuador and Peru have been designated ino by FELDER. ino.

A. hippodamia F. (= pytho Fldr.), from Central and Southern Brazil, is a very similar, but smaller species hippodamia with broader bands on the forewing and narrower ones on the hindwing. - pallida Godm. & Salv. is a form pallida. with brownish vitreous spots, similar to ceto; in Central Brazil.

14. Genus: Callithomia Bates.

In the species of this genus not the lower discocellular but the middle one is angled. The cell is long and extends almost to the margin. They are mostly medium-sized species, which occur especially in the northwest of South America and also in Central America.

C. hezia Hew. (36 b) has very broad wings and strongly recalls Hirsutis pinthias in the marking. There hezia. occur here as there also the corresponding varieties, in which a yellow macular band is present on the hindwing, hezia is the commonest form, from Central America, with black-brown, yellow-spotted forewing and red-brown hindwing with dark apex. - hedila Godm. & Salv. is a form from Guatemala with larger, partly hedila.

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128

CERATINIA. By R. Haensch.

confluent yellow spots in the forewing. On the hindwing the black marking is broader and occupies nearly tridactyla. half the wing. — In tridactyla Dev. (36 b), from Colombia, there is a yellow macular band behind the discocellular of the hindwing, similar to that of *Hirsutis hecalesina*, and the base of the hindwing is black-brown.

- phagesia. C. phagesia Hew. (36a), from Ecuador, has similar markings; at the base of the forewing there is a red-brown stripe, and the spots are larger and dirty white. In the hindwing the area before the apex is transparent whitish.
- megaleas. C. megaleas Godm. & Salv., from Panama, is said to have in the forewing a red-brown base, 6 yellow submarginal spots and a yellow oblique band. The hindwing is red-brown with narrow black distal margin.

C. schulzi Hsch. (36 b), from the Lower Amazon, has large yellow spots in the forewing, and the basal sehulzi. third red-brown. The hindwing has a median macular longitudinal band and large marginal teeth with yellow alexirrhoë. dots. In the 3 the anterior half of the hindwing is transparent yellowish, in the 9 red-brown. - In alexirrhoë Bates, from the Upper Amazon, near S. Paulo, the ground-colour is darker red-brown. The hindwing is zeuxippe. not yellowish-transparent and the marginal dots are white. - zeuxippe Bates, from the Cupari (a tributary of the Amazon), has at the base of the forewing broad black margins. The apex is dark brown, with 3 yellowish thornax. spots and red-brown margins. -- thornax Bates, from the Upper Amazon, near Tabatinga, has blackish apex yellowish spots in the apex of the forewing and a broad, dentate black distal margin to the hindwing. philomela. philomela Godm. & Salv., from Colombia, is said to approximate to zeuxippe, but to have narrower forewing, whilst the hindwing is semitransparent with black apex. The black macular band is placed nearer to the lower end of the cell. - The last 5 forms all intergrade more or less with one another, being apparently local forms still in course of development, so that it is very difficult to refer the transitional specimens to the individual infuscata, forms. — On the Ucayah in Peru there is further a peculiar form, which I call infuscata form. nov. Here the forewing is yellow-brown with dark margins and in addition to the black median spot in the cell a roundish spot is placed in the end of the cell and 3-4 oblong spots in the apical third. The hindwing has 2 macular bands, in the disc and at the anal angle. This form recalls Hyposcada rezia.

hydra.
 C. hydra Fldr. (= valera Stgr.), from Venezuela, has blackish forewing with 3 yellow macular bands beronilla. and brownish base. The hindwing is red-brown with dark distal margin. — In the somewhat larger beronilla Hew. (36 c), from Colombia and Ecuador, the central macular band is absent and the proximal one is not divided panamensis, by a triangular black spot, as in hydra. — The nearly allied panamensis Godm. & Salv., from Panama, has a broad yellow oblique band, in which several roundish black spots are placed. The hindwing is broadly

has a broad yellow oblique band, in which several roundish black spots are placed. The l black at the apex and distal margin.

procee. C. procee Godm. & Salv., from Colombia, is said to have the apex of the forewing black as far as the end of the cell, and a broad yellow oblique band, which is divided by a red-brown stripe over the 2. median vein.

villula. C. villula Hew. (36 c). This interesting species has exactly the markings and colouring of certain Ceratinia, e. g. praxilla and ocna; but it may be recognised by the angled middle discocellular, resp. not angled lower one. On the under surface the hindwing has a white double spot at the costal margin near the middle and 6 white distal-marginal dots. Colombia.

15. Genus: Ceratinia Hbn.

This genus contains numerous species of very varied appearance, mostly of medium size. It may be recognised by the very long cell of the forewing (especially in the \Im) with angled lower discocellular, yet there are differences in the neuration even in specimens of the same species. The species of this genus occur from Mexico to Brazil and Argentina. Many forms of the plains are at times very common, whilst others from the valleys of the Andes are quite local and rare. The wing-pattern and colouring in *Ceratinia* is very varied. Although the *Lycorea*-habitus predominates, yet there are also many forms with vitreous or otherwise marked wings, so that similarities to almost all the markings which occur in other Ithomiid-genera may be found.

polymnides. C. polymnides Hsch. The marking is similar to that of Mechanitis polymnia, with broad yellow median band, without subapical spot on the forewing and with 2 black-brown zigzag bands in the disc and at the anal angle of the hindwing. Upper and lower surface are without distal-marginal dots. In Central menans. Colombia. — In menans Hsch., from the same localities, the forewing has moreover 6 yellow distal-marginal dots, which are largest in the apex. In the 3 the costal margin of the hindwing is lighter and transparent.

Publ. 31. V. 09.

CERATINIA. By R. Haensch.

C. amica Weym., from Colombia and Ecuador, is similar to polymnides, but has only 3 black dots amica. in the disc of the hindwing and a narrow black distal margin. The yellow transverse band of the hindwing is only half as broad. — The similar **baana** Druce, from Peru, is said to be distinguished among other details baana. by white marginal dots on the under surface, which are wanting in *amica*.

C. mansuetus *Hew.*, from the Upper Amazon, has similar markings to *moebiusi* following hereafter. *mansuetus*. The wings are shorter and more rounded. The forewing has in addition 3 yellow dots at the distal margin and the hindwing 4 black spots in the disc, whilst the narrow distal border is strongly dentate at the inner angle. In specimens from Peru the yellow dots on the forewing are absent. — **moebiusi** *Hsch.* (34 d) has a broad *moebiusi*. yellow oblique band in the forewing. At the inner angle of the hindwing there is a large black band-spot and at the end of the cell 2 more isolated spots.

C. honesta Weym. (34 d) is a similar species with differently formed oblique band and rounded black honesta. spot in the hindwing. Of the two black spots at the end of the cell of the forewing the one at the costal margin is here the longer, in moebiusi just the reverse is the case. This species flies on the eastern slopes of the Andes of Ecuador, whilst the local form **bicolora** Hsch., in which the yellow oblique band is absent, occurs still bicolora. further east, on the upper Rio Napo. The latter resembles, besides the larger Melinaca mothone and Mechanitis deceptus, especially Hyposcada fallax and Ceratinia semifulva. fallax is recognised at once by the large black antennae and the short cell of the hindwing; semifulva, in addition to its smaller size, by the dark base of the forewing and only 2 black spots at the end of the cell.

C. mamercus *Hew.* is similar to *mansuetus*, but smaller, with broader, short, distally convex yellow *mamercus*. oblique band. The black median band of the hindwing and the distal border, which is broad at the inner angle, are united at the inner margin. In some specimens median band and distal border are joined into a large patch. Flies on the eastern slopes of the Andes of Ecuador. — Thence comes also the similar **aemilia** *Hew.*, *aemilia*. with narrower oblique band and yellow marginal spots in the apex of the forewing. At the inner angle of the hindwing is placed a distally divided black spot.

C. manaos Bates is similar to mamercus and rowena. Yellow band of the forewing extending into the manaos. cell. Hindwing with 2 black macular bands. From the lower Rio Negro. — rowena Hew. is a smaller form rowena. from Colombia with narrow yellow oblique band, double spot at the end of the cell, long wedge-spot and broad streak at the base of the forewing, as well as large double spots at the inner angle of the hindwing. — In achaea achaea. Hew., from eastern Ecuador, which is of the same size, the oblique band is divided into 2 spots at the end of the cell and the inner angle of the forewing. The hindwing, including the costal margin, is for the most part black-brown, only the apex is red-brown. — semifulva Salv. (34 d) has already been mentioned under bico- semifulva. lora. It is the local form of achaea or a nearly allied species, without the yellow oblique band on the forewing. It occurs, like all the similar forms, in eastern Peru and Ecuador, together with occulta Hsch., which has occulta. 3 more yellow spots in the apex of the forewing and white distal-marginal dots on the under surface.

C. apollinis Stgr. (34 d) approximates to aemilia, but has larger yellow subapical spots in the forewing apollinis. and a large black spot at the inner angle of the hindwing. It flies on the Upper Amazon near Iquitos.

C. viola Hsch. (34 e) has a distally lobed yellow oblique band in the forewing, dark distal margin and viola. spot at the end of the cell of the hindwing. The ground-colour is dark brown-red. It flies on the Upper Amazon, together with the similarly coloured Melinaea satevis and madeira. — In the local form boliviensis boliviensis. Hsch. the ground-colour is lighter red-brown; the hindwing has a dark median band and broader distal margin. — herbita Weyn., from Surinam, has a similar yellow oblique band, and on the hindwing the median band herbita. and distal margin dark.

In **C. catilla** *Hew.* (34 e) the apex is broadly black to the end of the cell, then follows proximally the *catilla*. yellow oblique band. The broad black distal margin of the hindwing is united at the apex with the median band. The ground-colour is dark red-brown. Bolivia.

C. cantobrica *Hew.* (34 e) has yellow spots at the apex and distal margin of the forewing and also a *cantobrica*. curved yellow macular band. The distal border of the hindwing is narrower. The ground-colour is red-brown. The habitat is Bolivia. — In the smaller **pamina** *Hsch.* the yellow spot is narrower and also proximally mar-*pamina*. gined with black. The yellow marginal dots are absent. This form comes from the frontier districts of Peru and Bolivia.

C. pyrippe Hpffr., from Peru, is a form with broad yellow oblique band in the forewing and narrow pyrippe. streak-like longitudinal band in the hindwing. — In tenna Hsch. (34 e) on the other hand the oblique band tenna. is narrow, the dark distal margin of the hindwing broader. Eastern Ecuador. — In napona Hsch., which napona. is the same size, the oblique band of the forewing is broken up into 2 spots; the two black basal spots are larger; the distal margins have yellow marginal dots. — In ab. calva Hsch., which also flies on the upper Napo, the calva. black longitudinal band in the disc of the hindwing is absent. In the \mathcal{J} the anterior third of the hindwing is semitransparent.

CERATINIA. By R. Haensch.

nina. **C.** nina Hsch, is larger than napong and has a complete undulate transverse band in the forewing: callanga. further 2 yellow spots near the end of the median. Bolivia. — In callanga Hsch. (34 e) the yellow oblique band and the spots at the end of the cell have assumed the red-brown ground-colour. There is sometimes, especially on the under surface, another red-brown oblique band in the apex of the forewing. This form occurs at the boundary of Peru and Bolivia near Yungas.

C. fenestella Hew. (34 e) is a form similar to nina, with yellow oblique band and broader longitudinal jenestella. intermedia. band on the hindwing; from Venezuela. -- intermedia Bilr., from eastern Colombia and Ecuador, has the oblique band as in fenestella; above yellow marginal dots, beneath white ones. Hindwing with abbreviated peruviana. longitudinal band. - In peruviana Stgr., from Peru, the hindwing in the 3 is transparently yellowish at the hemimelas. costal margin, in the φ the marginal spots are yellow beneath. — In the form hemimelas Stgr., from Chanchamayo, the distal border and the longitudinal band of the hindwing are merged into one patch. - The Central valora. American form of fenestella, from Costa Rica, which I call valora form. nov., is larger and has very large, oblong yellow spots in the apex of the forewing. On the upperside of the hindwing the white marginal spots are absent.

C. ninonia Hbn. (34 f) is a smaller species and occurs in typical examples chiefly in Guiana and on ninonia. the Lower Amazon. The disc of both wings is transparent in the 3, but on the hindwing more brownish than in the figure. The yellow transverse band of the forewing is very broad. The yellow marginal dots are rather bari. large in this and the following forms. - BATES describes as bari a form from Tocantins and Tapajos, which completa, is said to have a narrower hindwing and paler, yellow spots. - In the larger completa Hsch. (34 f), from the Upper Amazon, the yellow oblique band is only half as broad and does not extend into the cell. - In the maculata, form maculata Hsch., from the Lower Amazon, the band is divided into 2 yellow spots. This large local form latefasciata. has very broad wings and large yellow marginal dots. - In latefasciata Hsch. the black spots at the end of the cell of the forewing are small, hence the yellow oblique band is very broad. It flies on the Upper Amazon, philidas, whilst the similar philidas Godm. & Salv. has its habitat in Colombia. The latter has a much broader black median band on the hindwing and no yellow marginal dots on the upper surface of the hindwing.

The very similar C. mutilla Hew. (34 f), from British Guiana, has a pale yellowish oblique band and in addition a red-brown spot towards the apex. The longitudinal band of the hindwing is mostly very broad. pellucida. --- In ab. pellucida Hsch. the black spots at the end of the cell and the distal margin of the forewing form a broad band; the longitudinal band of the hindwing, on the contrary, is narrower. This form flies together with the preceding.

A similar form, from Venezuela, which I call C. vallina spec. nov., is larger and has very broad wings. vallina. The longitudinal band of the hindwing is narrow and placed very far distad, so that the semitransparent discal area becomes very large.

C. granadensis Hsch. stands rather isolated, only to some extent recalling philidas. The yellow oblique granadensis. band is very broad and in it are placed at the end of the cell the two black spots, which are here very small, whilst the third in the end of the cell is very long and wedge-shaped. At the apex and again at the distal margin there are 2 white dots. The hindwing is as in *philidas*, with narrower black longitudinal band. In Central Colombia.

C. maenas (Bang-H. i. l.) (34 f) has the pattern somewhat like that of latefasciata, but the yellow transverse band of the forewing and the yellow marginal dots are absent. It flies with the similarly coloured forms of other genera on the Upper Amazon.

C. antonia Hew. (34 g) has a yellow-brown ground-colour and different yellow macular band. The antonina, yellow marginal dots are very large, but smallest in the apex of the forewing. - In the similar antonina Stgr., from the Upper Amazon, it is just the reverse, the marginal dots are largest in the apex, moreover the macular band is much smaller, proximally edged with black. antonia from western Ecuador differs moreover in the longitudinal band of the hindwing, the spots of which are largest at the apex.

C. fimbria *Hew.*, from Colombia, has a broad vellow oblique band on the forewing, which is divided fimbria. by a black macular band, so that there is a large yellow patch at the inner angle. The marginal dots of both nemea, wings are white. — In the similar nemea Weym. (34 g), also from Colombia, the yellow band is narrower and differently formed. The hindwing is not transparent as in fimbria.

C. philetaera Hew. (84 f) may be recognised by the large yellow median spot on the forewing and the philetacra. broad black distal border of the hindwing. In the distal margin of the forewing and mostly also of the hindwing are placed yellow dots, among them 2 larger ones in the apex of the forewing. The habitat of this easily recognised species, which resembles Melinaea idae, is Colombia.

leprieuri. C. leprieuri Feisth., from Cayenne, has similar hindwing, which is black also at the costal margin, and white marginal dots. The yellow median spot is distally rounded; the black spots at the end of the cell are joined rectangularly with the spot at the median.

C. ignorata Hsch. (34 f) has similar markings, but yellow marginal dots on the forewing, and the hindianorata. wing is red-brown, with black, yellow-dotted distal margin and black longitudinal band. This species flies

mutilla.

maenas.

antonia

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CERATINIA. By R. Haensch.

on the Upper Amazon. — In the local form **michaëlisi** *Hsch.*, from the Lower Amazon, the yellow patch is *michaëlisi*. divided by a black oblique band from the discocellular to the inner angle.

C. cornelia Guér., from Bolivia, has a narrow yellow oblique band on the forewing and 4 yellow spots cornelia. in the broad black distal margin of the hindwing, as well as a black spot at the apex. — In the similar sellana sellana. Hsch. the oblique band is divided into 2 spots; the middle marginal dots are absent in the forewing. The distal margin of the hindwing is proximally widened into teeth.

C. fulminans *Bitr.* (34 g) has a narrow yellow oblique band, strongly angled distally. The black spot *fulminans*. at the end of the cell is proximally forked. The hindwing has a narrow distal border and a longitudinal band of 3 black spots in the disc. The ground-colour is light yellow-brown. — This form from Colombia is represented in eastern Ecuador by the dark red-brown **satura** *Hsch*. In this the yellow colour is wanting in the *satura*. end of the cell of the forewing and at the apex of the hindwing.

C. angelina *Hsch.* (34 g), from the Ucayali (tributary of the Upper Amazon) has the pattern similar *angelina*. to that of *fulminans*. But the yellow marginal band and the distal-marginal dots are absent. The apex is more narrowly black, on the other hand the macular band in the disc of the hindwing is much broader, partly confluent with the dentate distal margin.

In a smaller species, **C. soror** Srka., which is confusingly like Melinaea lucifer, the oblique band is like-soror. wise absent. The apex of the forewing is, however, more broadly black and the yellow spots in it are merged into one large one. In the hindwing longitudinal band and distal margin form a large black patch, as in Melinaea lucifer. This interesting species comes from Pebas on the Upper Amazon.

The description of **C. acceptabilis** Weeks, from Bolivia, has unfortunately not been obtainable. The large, broad-winged **C. anastasia** Bates has the pattern similar to **anastasina** Stgr. (35 a), anastasia. but behind the end of the cell of the forewing another yellow zigzag band, like that of fulminans, and 7 yellow marginal dots. anastasia flies in the damp primeval forests near Ega on the Upper Amazon, whilst anastasina occurs further up at the foot of the Andes in Peru. — **castanea** Btlr., from Rio Juruá, is a darker form of castanea. anastasia, in which the yellow oblique band reaches to the hinder angle of the forewing. These 3 forms closely resemble Melinaea maëlus (= pardalis Bates) resp. cydon.

C. porsenna Srka. (= amabilis Stgr.) is similar to *anastasius* in size and markings. The yellow apical porsenna. spots in the forewing are much larger and proximally edged with black. On the hindwing the median band and the dark distal margin are united into a large patch. — This form flies, like the similar soror, on the Upper Amazon near Pebas.

In **C. fluonia** *Hew.* and the allied forms the anterior half of the yellow oblique band of the forewing *fluonia*. is curved distad, as may be seen in the figure of *berna* (34 g). *fluonia* has a four-branched, yellow macular band, which enters the cell and nearly reaches the inner margin. The black double spot at the end of the cell has also a corresponding curved projection towards the apex, as in *pardalina* (34 g). The hindwing is like that of *berna*. *fluonia* flies on the Upper Amazon, whilst the local form **berna** *Hsch.* (34 g) comes from *berna*. the upper Napo in Ecuador. The latter has instead of the large macular band in the forewing only 2 oblong yellow spots in the black apical area.

C. pardalina Hpffr. has a yellow oblique band in the forewing. The aberration figured (34 g) was des-*pardatina*. cribed by DRUCE as **tigrina**. In the latter only a yellow spot at the discocellular remains of the band. Other-*tigrina*, wise the marking and colouring is similar in both forms. Of the black colour in the apex of the forewing only marginal dots remain in *fluonia*, whilst in the hindwing the black median band and the distal border are widened. The species resembles the respective local forms of *anastasia* and *Melinaea maëlus*. Both forms fly on the Upper Amazon in Peru; *tigrina* may, however, occur further up. — **pantherina** Stgr., likewise from *pantherina*. the Upper Amazon, is an intermediate form between *fluonia* and *pardalina*, in which red-brown spots appear in the apex of the forewing. The black median band of the hindwing is as in *fluonia*.

C. thea *Hew.* recalls *catilla* (34 e), but the yellow median spot is rounder and does not extend so far *thea*. to the hinder angle. In a smaller form, which STAUDINGER named **theatina** (i. l.) (35 a), the yellow spot *theatina*. is likewise rounder than in the figure. This form is, however, considerably smaller, has lighter ground-colour, and at the end of the cell of the forewing there are only 2 small, black spots, whilst in *thea* a large black spot extends into the yellow and is joined to the black costal and distal margin. The hindwing has in both forms a black distal border and median band, which sometimes touch at the apex. They fly on the Upper Amazon and its tributaries.

C. xanthostola Bates (35 a) stands completely isolated. The hindwing is much shorter than the fore-*xanthostola*. wing, which is not brought out clearly in the figure. In this the species recalls some Napeogencs-species. Very striking moreover is the absence of the median band on the upper surface of the hindwing, as is also the case in Mechanitis macrinus. In an aberration, which I have described as **desmora** Hsch., the black spot at the desmora. base of the forewing above is absent and the black bordering at the proximal side of the yellow spot is much narrower. Both forms fly on the Middle Amazon.

CERATINIA. By R. Haensch.

- C. dionaca Hew. I only know in typical specimens from Central America (Honduras, Guatemala), on dionaea. fraterna, the other hand in Venezuela a local form occurs which I designate fraterna form. nov. (35 a). In dionaea there is proximally to the yellow oblique band a larger yellow spot which is joined to the red-brown basal part. In fraterna there is instead only a small spot which is mostly confluent with the oblique band, but is proximally edged with black. Moreover, in *fraterna* the yellow colouring is brownish and the distal-marginal dots are smaller. In Mechanitis there are 2 corresponding forms: doryssus from Central America and veritabilis from limpida. Venezuela. — limpida Hsch. is a peculiar form of fraterna, in which the yellow bands and spots are very broad and transparent; a stripe at the costal margin of the hindwing is of the same colour. This interesting local form recalls Mechanitis franis and flies like the latter in the Cauca Valley in Colombia.
- In C. mergelena Hew. (35 a), from Colombia, the median band of the hindwing is reduced to a black mergelena. spot at the apex, which is connected with the broad black distal border. At the base of the forewing there megalopolis, is further a proximal yellow oblique band, which is divided by a large, triangular black spot. - In megalopolis Fldr., likewise from Colombia, this black spot is absent, so that a broad yellow oblique band is formed, as in Mechanitis macrinus. The yellow spots at the end of the cell on the other hand are small, and also the white marginal dots on the hindwing.
- C. callispila Bates (35 a), from Costa Rica, has a black-brown forewing with numerous yellow spots callispila. and red-brown base. The hindwing is red-brown with dark distal margin, blackish apex and spot at the end cleis. of the cell. - In cleis Bates, from Panama, the yellow spots in the disc of the forewing are much smaller. The distal margin of the hindwing and the spot at the end of the cell are united into a large patch in the apical mylassa, third. — As mylassa DRUCE describes another form, from Veragua, with broad black apex and distal margin to leucania. the hindwing, which, however, are not confluent with the spot at the discocellular. -- leucania Bates, from Panama, is similar to callispila, but has white spots in the forewing which form an oblique band at the end of the cell. The hindwing has dark distal margin and a narrow longitudinal band.
- C. decumana Godm. & Salv. (= centralis Stgr.) (35 b). This fine, large species and especially the local decumana. excelsa, form excelsa Fldr. recall the similar Ituna lamirus and Olyras montagui. The markings resemble those of callispila; the yellow spots are larger and transparent. On the hindwing the spot at the end of the cell is absent. In decumana the base of the forewing is black-brown, whilst excelsa has a red-brown stripe along the median vein. Moreover, the hindwing on the upper surface of decumana is uniformly red-brown in the disc, in excelsa a transparent oblique band runs from the apex to the inner margin. decumana flies in Panama and Costa Rica, whilst excelsa comes from Colombia. - STICHEL erected the genus Oreogenes for these two forms, but the characters in the neuration are not constant.
- With C. vallonia Hew. (35 b) we come now to a group which is distinguished by a broad, transparent band vallonia. in both fore- and hindwing. The forms are all indigenous to eastern South America, especially Brazil. In vallonia the yellow oblique band of the forewing forms a semicircle. In the cell is placed a triangular black spot. The band of the hindwing is transparent red-brown. The antennae are yellowish, with dark base. The daëta, species occurs on the Upper Amazon and in Guiana. — In the somewhat larger daëta Bdv. and the following forms the band of the hindwing is yellow, antennae dark with yellow club. The apex of the forewing in dacta is broadly black with 3 large white dots. At the hinder angle is placed a red-brown spot, whilst in the very euryanessa, similar, but larger euryanessa Fldr. (35 b) this angle is black. The latter form has very delicate, transparent colouring, even in the apex of the forewing. The black oblique band before the end of the cell of the forewing is posteriorly broad and dentate, in *daëta* posteriorly reduced. Finally in *daëta* and the following forms the base of the hindwing beneath is yellow, but in euryanessa red-brown. The two forms occur together in numbers in central and southern Brazil in the dense virgin forests. - Larva and pupa of euryanessa according to SEITZ are stout. The pupa is rounded, yellow-brown, darker at the wings, adorned all over with small black wavy markings. daëtina, — daëtina Weym. is a very rare form of daëta with dark mahogony-brown ground-colour and broad black bands and margins. In addition to the two yellow bands there is a yellow spot on the discocellular of the forewing. - As evanescens. evanescens (= melphis Hbn.) I designate a very light, transparent form of daëta. Not only the very broad, light yellow band of the hindwing, but also the whole disc of the forewing is transparent yellowish. The red-brown colour is confined to the base and a spot at the hinder angle of the forewing and also a narrow stripe at the laphria. distal margin of the hindwing. - laphria Dbl. (35 b) is another very similar species from central Brazil. Size and markings as daëta, but not transparent. The white spots in the apex of the forewing smaller. Across the end of the median a further black streak. The eggs of laphria are laid in clusters on the leaves of a Solanaceae. The young larvae are yellow-brown with dark head; later they have 3 dark dorsal stripes which are connected by transverse lines. The pupa is short and stout with metallic surfaces at the sides. The pupal stage lasts about 11 days.
 - melphis. C. melphis Godt., from the Antilles, which is unknown to me in nature, is said to have black forewing with 3 pale yellow-red bands and 3 white dots in the apex. The hindwing is yellow-red with black costal and distal margins, and also a median band, which does not reach the distal margin.

CERATINIA. By R. Haensch.

As C. mysotis spec. nov. I designate a species from Venezuela similar to evanescens, with shorter wings, mysotis. in which the red-brown colouring is absent except for the spot at the hinder angle. The hindmargin of the forewing is broadly blackish to the median. Both wings have white marginal dots.

C. fiammetta Hew. is a peculiar, rare species from South Brazil of the size and pattern of laphria. On fiammetta. the forewing the red-brown colour only extends from the base to $\frac{1}{3}$, behind it there are 2 transparent spots apically before the vellowish band. On the hindwing the red-brown is entirely absent; this is transparently vellowish, with broad black distal margin and small white marginal dots.

C. metella Hpffr. (35 b. c) (= alexia Druce), from eastern Peru, has in the 3 transparent yellowish metella. wings with black margins and a half-band at the end of the cell of the forewing. The base of the forewing and the proximal half of the hindwing are reddish yellow-brown. Both wings have small white distal-marginal dots. In the Q the wings are scarcely at all transparent, much more brightly coloured, with broader, black margins. The disc of the hindwing is red-brown. - In the similar oulita Hew. the base of the forewing is oulita. blackish, and the black margins are broader. It occurs further south at the boundary of Peru and Bolivia. - trimaculata Weym. is a form from Colombia with very broad black costal and distal margins to the hind-trimaculata. wing, so that in the Q only a smaller, yellow-red spot is present at the inner angle.

The 3 of C. norella Hew. has a deep black basal half to the forewing, in which a yellow spot is placed norella. at the end of the cell. In the Q the whole forewing is black except for the vellow spots in the disc and the white marginal dots. The form occurs only in the valleys of the Andes of Ecuador, south-east of Cuënca. - In the allied norellana Hsch., from the upper valley of the Napo in Ecuador, the base of the hindwing norellana. is not yellowish and the reddish colour only extends to the end of the cell. The part between this and the broad distal margin is transparent blackish. This rare form occurs in open places in the primeval forests, where it is fond of hovering round single trees at a few metres from the ground or resting upon projecting branches. — nora Hsch. is another allied form from Peru. Here the forewing is as in norellana, the base trans- nora. parent. The black spot at the end of the cell is isolated. The hindwing is only reddish at the anal angle, as in lurida (35 c), the distal half is transparent yellowish.

C. lurida Btlr. (35 c) is marked like nora, but has white dusting instead of the yellow colour in the disc lurida. of the forewing and at the end of the cell of the hindwing; also the underside of the abdomen is whitish, in the preceding form vellow. — The smaller tricolor Salv. has similar markings to oulita Hew., but also white tricolor. instead of yellow colour. In the Q there is an oblong white patch at the end of the cell of the hindwing. ---Whilst in tricolor the black spot at the end of the cell of the forewing is broadly connected with the costal margin, in an otherwise very similar form, which I call florens form. nov., there is only a narrow, isolated streak at florens. the end of the cell. — The last three forms are found at the boundary of Peru and Bolivia.

In the following species the wings are almost entirely vitreous.

Some, as **C. ocna** *H.-Schäff.* (35 c), have still a small red-yellow spot at the anal angle of the hindwing. *ocna*. The base of the wing is yellowish. This species flies singly in eastern Colombia and Ecuador. — **adelinda** *adelinda*. Hew., from Ecuador, is a very similar form, with broader, black distal margin, without white marginal dots on the upper surface.

C. praxilla Hew. is an allied, somewhat larger species from eastern Ecuador, without yellow colour praxilla. at the anal angle of the hindwing. In contrast to ocna and most of the allied forms, praxilla, cocno, etc., have black antenna and a white spot at the base of the hindwing beneath, the former a yellow streak and yellow club to the antenna.

C. guttata Weym. is a form of coeno Hcw. (35 d). It has a red-yellow spot at the anal angle of the guttata. hindwing. coeno itself, from Colombia and Venezuela, has the basal half of the hindwing dusted with yellow. In the 3 the black distal margins are narrower. — ab. latilimbata Weym. is a form of coeno with broad black latilimbata. margins and large white marginal dots, from Colombia.

In C. frater Salv., from Peru, the wings are dusted with whitish, and at the anal angle is placed a smaller frater. yellow patch.

In C. cana Hsch., from Colombia, the wings are dusted with whitish, the yel'ow patch is absent. On cana. the other hand a blackish band runs across the middle of the cell of the forewing.

C. statilla Hew. (35 c) is distinguished from the very similar frater by the yellow club of the antenna statilla. and yellow underside of the abdomen, which is grey in *frater*. The end of the cell of the forewing is without markings, whilst in atagalpa Hsch. a blackish band is placed across the end of the cell of the forewing. Both atagalpa. forms come from eastern Peru.

C. antea Hew. (35 d), from Ecuador, the largest species of the genus, has colourless wings with broad antea. black margins and small, white distal-marginal dots. The club of the antenna, base of the hindwing beneath and underside of the abdomen are yellow. On the high bank of the upper Pastaza this interesting species was

HETEROSCADA; NAPEOGENES. By R. Haensch.

found rather commonly among immense trees, together with the very similar Napeogenes glycera and lycora, Ithomia linda, Hypoleria coenina, Threnodes coenoïdes, etc.

eupompe. The last species of this extensive genus, C. eupompe Geyer (= phlysto Fldr.) (35 d), from South Brazil, stands quite isolated, much more recalling certain species of the genera Napeogenes, Ithomia and Pteronymia. The wings are short, transparent yellowish, with black margins and a half-band across the end of the cell of the forewing; on the under surface with rows of red-brown spots and whitish double spots. Antenna black, collar red-brown. — Larva according to W. MÜLLER rather transparent, above grey-green, head yellow, later black. Pupa transparent green, with shiny gold lines and black spots.

16. Genus: Heteroscada Schatz.

This genus contains only 2 small, yellowish forms, which occur in Brazil. The middle discocellular of the hindwing is weakly curved proximally, the upper one in the 3 is long.

- gazoria. H. gazoria Godt. (= yanina Hew.) (36 d). This pretty little species is very similar to Pteronymia hemixanthe (40 d). The collar is red-brown, the abdomen beneath yellow. The wings are dusted with yellow to beyond the end of the cell and have dark margins.
- fenella. The somewhat larger **H. fenella** Hew. has broader borders, a broader half-band across the end of the cell of the forewing and a red-yellow spot at the base. It closely resembles Napeogenes xanthone. Both species fly in Central Brazil.

17. Genus: Napeogenes Bates.

In this extensive genus there are many forms whose pattern and colouring recur in certain Ithomias, so that they can only be recognized by the neuration. All the *Napeogenes* may be distinguished from the similar species of other genera by the non-angled discocellular, the long cell and the apparently 5-branched median in the hindwing. — The species are scattered over the whole Neotropical region, mostly mixed with the corresponding species of other genera, but are usually rare, whilst the more vigorous Ithomias are met with in large numbers.

- peridia. N. peridia Hew. (35 d), from Colombia, has similar markings to Callithomia tridactyla and Hirsutis hemimelaena. Godm. & Salv., from Panama, the yellow spots at the end of the cell of the forewing are united into one large one, as in iquitensis (35 d). The yellow spots at the apex and distal margin of the hindwing on the contrary are very small and the apical half consequently much more strongly coloured with black.
- *iquitensis.* **N. iquitensis** Stgr. (35 d), from the Upper Amazon, has in the black apical half of the forewing a broad, curved, yellow band; in the red-brown basal half 2 black spots and on the red-brown hindwing a black macular band and dentate distal margin.
 - amara. N. amara Godm. (35 d), from Central America, is smaller than *peridia* and has in the apical part of the forewing fewer, but larger, yellow spots, and at the base a red-brown spot. The marginal dots are smaller and white. At the apex of the hindwing are placed 2 indistinct yellowish spots. — In the somewhat larger tolosa. tolosa Hew. (35 e) the ground-colour of the hindwing and the base of the forewing are lighter yellow-brown. The yellow spots of the forewing are larger, the distal border of the hindwing narrower. tolosa inhabits Mexico
 - and northern Central America. olyrina. The interesting and rare N. olyrina Hsch. (35 e), from Bolivia, recalls Ceratinia excelsa and Olyras mon-
 - *tagui*. The black forewing has large whitish vitreous spots, the red-brown hindwing bears in addition to the broad, dark marginal band a hyaline oblique band in the apical half, as in *excelsa*.
 - larina. N. larina Hew. (35 e), from eastern Colombia, has white spots on the forewing; of the marginal spots those in the apex are larger; the base of the forewing is red-brown. In the disc of the hindwing are placed 3 isolated black spots. Ithomia candescens is very similar.
 - aethra. N. aethra Hew. (35 e), from the upper Napo in Ecuador, has larger, band-like, yellow spots in the disc of the forewing and indistinct yellow marginal dots. The hindwing is dark-margined, with 4 black spots in the disc.
 - duessa. N. duessa Hew. (35 e) may be recognised by the chestnut-brown ground-colour and the two black halfbands at the apex of the hindwing. The forewing has a yellow median spot with black dot and a dark brown base. This peculiar species flies on the Upper Amazon in Peru and Ecuador.
- *quadrilis.* In N. quadrilis *Hsch.*, from the Upper Napo, the ground-colour is yellow-brown and the yellow median spot of the forewing is prolonged, forming an oblique band. In the dark-margined hindwing a large black-brown spot is placed at the inner angle.

NAPEOGENES. By R. Haensch.

The following 5 forms are all very nearly allied; they have the usual ground-colour with black apical half and black cell-spot on the forewing, also dark dentate marginal band on the hindwing and 3—5 black spots in the disc. — N. terastis *Hsch.* (35 e) has a yellow median and subapical band on the forewing. — *lerastis.* It is the form from the Lower Amazon, whilst in **zurippa** *Hew.*, from Bolivia, the median band is broken up *zurippa*. into 2—3 spots. — **otaxes** *Godm.*, which, like the two following forms, occurs in Peru, has a pale, yellowish olaxes. median band and in the apex 2 dots of the same colour. — **pyrrho** *Druce* has still the yellow subapical band, *pyrrho*. but the median band is also absent except for 2 yellow dots. *deucation*.

N. hygia Godm., from Surinam, which is unknown to me in nature, is said to resemble Mechanitis hygia. polymnia.

N. stella Hew. (35 f). In this small species and its local forms from eastern Colombia and Ecuador stella, the blackish colour in the distal half of both wings is almost entirely suppressed by the yellowish vitreous spots. Calloleria jolaia has a very similar pattern and can only be distinguished by the neuration. — In the somewhat larger glabra Godm., from Colombia, the wings are still more transparent and the marginal dots yellow. The glabra. inner margin of the forewing is black. — aster Godm., from Ecuador, has darker wings and smaller marginal aster. dots. — In the similar decora Godm. the margins of both wings are much broader. The forewing has a dark decora. streak through the cell.

N. larilla Hew. (35 f), from Ecuador, has vitreous wings with dentate, dark distal borders and a spot *larilla*. at the end of the cell on each wing. In the Q the wings are broader, the margin of the forewing red-brown and the white marginal dots on the hindwing much larger. This rare species recalls Velamysta pardalis and Dismenitis theudelinda, with which it occurs in the mountain forests up to heights of 2500 m.

N. cranto *Fldr.* (35 f). from Colombia, has the margins and a half-band across the end of the cell of *cranlo*. the forewing dark brown. The base of the forewing and the hindwing are dusted with yellow. — The similar **paedaretus** *Godm.* & *Salv.*, from Costa Rica, is more brightly coloured and has yellow-brown veins, also at the apex *paedaretus*. and the dark costal margin of the forewing 2 oblong yellow spots. In the \mathcal{Q} the base of the forewing is dark and the hindwing is yellow-brown.

In the smaller N. harbona Hew. (35 f), from Ecuador, the wings are colourless, the margins black harbona. above and red-brown beneath, with indistinct, white marginal dots.

N. apulia Hew. (35 f), from Colombia, has a pattern like Ceratinia ocna, with red-brown spots at the apulia. inner angle of the hindwing. — In the somewhat larger **nausica** Weym., from Ecuador, the distal border of *nausica*. the forewing is broader, the inner border narrower. The red-yellow spot at the inner angle does not reach the base.

N. lycora *Hew.* (35 g), from eastern Ecuador, is similar to *apulia*, but the red-yellow colour at the *lycora*. inner angle of the hindwing is absent; the base of the latter is slightly yellowish. Moreover, the club of the antenna is yellow.

N. glycera Godm. (35 g) is confusingly like *Ceratinia antea*, but is somewhat smaller and the abdomen glycera. is grey-white beneath, in *antea* vivid yellow. It flies together with the similar forms on the upper Pastaza in Ecuador.

N. eunomia Godm., from Peru, corresponds to the similar Ceratinia frater from the same country. The eunomia. black margins are narrower, the base of the hindwing is yellowish.

N. flossina Bilr. (35 g), from eastern Colombia and Ecuador, has transparent wings with narrow, dark *flossina*. margins and at the base of both wings yellowish colouring. — A very similar form is hypsaea Stgr., from the hypsaea. Cauca Valley in Colombia. In it the veins at the end of the cell of the forewing are not margined with dark, and it is more weakly coloured at the base. The last two forms recall Episcada paradoxa and other similar Ithomias.

The following species, mostly smaller, have a dark oblique band across the end of the cell of the forewing. N. ithra *Hew.*, from the Lower Amazon, and **potaronus** *Kaye* (35 f), from British Guiana, have a posteriorly forked, dark oblique band and whitish patch. In *ithra* the wings are slightly reddish, the margins narrow, dark brown, the base of the forewing and the distal margin of the hindwing yellow-red. *potaronus* has colourless wings with broader, dark margins and red-brown spots in the distal margin of the hindwing.

N. cyrianassa Dbl. & Hew. (35 g), from the Amazons and Colombia, may be recognised by the teeth cyrianassa. of the black oblique band towards the apex. Hence the yellow oblique band is correspondingly sinuate. The hindwing has a broad, dark-edged, yellow-red submarginal band. — In ercilla Hew., from the Upper Amazon, ercilla. the subapical band of the forewing is white and divided into spots. — glycon Godm., which is unknown to glycon. me in nature, is said to be similar to cyrianassa, but with a triangular, black spot in the cell of the forewing. — adulta. adulta Hsch. and dilutata Hsch. are local forms of cyrianassa from British Guiana. adulta is larger and more dilutala.

NAPEOGENES. By R. Haensch.

brightly coloured. The base of the forewing is red-brown nearly to the end of the cell. In the apex is placed a row of red-brown dots. The red-brown band of the hinawing is broadly margined with black-brown. *dilutata* has narrower wings and yellow-brown ground-colour, which is extended beyond the end of the cell of the forewing and also borders the distal margin.

- inachia. N. inachia Hew. (35 g) is very similar to cyrianassa, but the projection is absent at the end of the cell of the forewing, which is more transparent yellowish at the base. The antenna is dark. In the local form moles. moles Hsch., from British Guiana, all the margins and borders are broader. The disc of the hindwing is yel-tunantina. lowish. The wings are short and broad. tunantina Bates, from the Upper Amazon, is said to be similar to cyrianassa, but with oval subapical spot on the forewing, so that the black oblique band at the end of the adelphe. cell is continued to the distal margin in the same width. adelphe Bates, from the Lower Amazon, is likewise said to be very similar to cyrianassa, with less transparent wings. Apical spot of the forewing almost uniformly broad. The black oblique band gradually narrowed.
- pheranthes. N. pheranthes Bates, from the Upper Amazon, is said to be similar to *inachia*, but with black collar and patagia, which are red-brown in the other forms.
 - *pyrois.* **N. pyrois** Bates, from the Lower Amazon, is likewise similar to *inachia*, but has no yellowish brown in the forewing. The anterior half of the hindwing, moreover, is yellowish.
 - corena. N. corena Hew. (36 b), from the Upper Amazon, as well as from eastern Peru and Ecuador, may be recognized by the broad, yellow-brown subapical band of the forewing, which is quite similar also in species of other genera, e. g.: Dismorphia erythroë, Leucothyris ilerdina, lubilerda, Hypoleria sarepta and others.
 - *lamia.* **N. lamia** *Hew.* resembles *Scada ethica* (36 d), but is appreciably larger and has larger white marginal dots, especially in the hindwing, as well as a non-forked band over the end of the cell on the latter.
- galinthias. A similar form is **N. galinthias** Hpffr., from Bolivia, in which the dark marking over the end of the cell of the hindwing is absent.
 - *rhezia.* N. rhezia *Hbn.* recalls *Ceratinia laphria*, but the black spot in the cell of the forewing and the white marginal dots on the upper surface are absent. The species occurs in Brazil.
- xanthone. In N. xanthone Bates (= yanetta Hew.) (36 b), from southern Brazil, the red-brown colouring on both richardi. wings is absent except for 2 streaks at the base of the forewing. ab. richardi Fruhst., from Central Brazil, on the other hand has stronger red-brown markings at the base of the forewing and in the distal margin of the hindwing.
- leptalina. N. leptalina Fldr., from Central Brazil, has similar markings to xanthone, but without red-brown at the base of the hindwing. It recalls Dismorphia methymna.
- crispina. N. crispina Hew., from Colombia, has a reddish base to the forewing and a dark spot at the costal margin at one-half the length of the cell. The black distal margin is proximally dentate on the veins.
- benigna. In N. benigna Weym., from Colombia, there is a reddish streak over the median of the forewing and the half-band on the discocellular is broad at the median.
- sulphurina. N. sulphurina Bates (= chinia H.-Schäff., pozziana Oberth.) (36 a) is a yellowish, dark-margined species from the Amazons and Brazil, recognizable by the black streak over the median at the base of the forewing and 2 white dots in its apex, as well as by the black antennae.
 - osuna. N. osuna Hew., from Bolivia, has broad black margins and in addition to the transverse band across the end of the cell of the forewing an interrupted band across that of the hindwing, as well as a band through azeka. the cell of the forewing. In azeka Hew. (35 g) the markings are similar, but more delicate. The bands through the cell of the forewing and across the end of the cell of the hindwing are here only indicated by the absence of the yellow dusting (which is not brought out well in the figure); also the oblique band at the end
 - gracilis. of the cell of the hindwing is quite narrow from the middle onwards. Colombia and Ecuador. gracilis *Hsch.*, from Bolivia, is similar to the preceding, with narrower margins and broader half-band across the end of the cell of the forewing, and without the band through the middle of the cell and across the end of the hindwing.
 - pteronymicrosis. N. pteronymiensis Hsch., from Colombia, has a colourless forewing and a yellow-dusted hindwing with dark margins spotted with yellow-brown beneath and a half-band of the same colour across the end of the cell of the forewing. Antenna dark with yellow-brown club. Apex of the forewing and distal margin of the hindwing with white marginal dots on the under surface.
 - *clva*, **N. elva** *Godm.*, from Colombia, which is unknown to me in nature, is said to have transparent wings with the margins blackish above and reddish beneath.
 - pharo. N. pharo Fldr. (36 b), from the Upper Amazon, is a commoners pecies, with yellowish vitreous areas and broad black margins, which have yellow-brown stripes beneath. The transverse band of the forewing is gradually

Publ. 31. V. 1909.

pointed. The antennae are black. — In the similar **avila** *Hsch.*, from eastern Ecuador, the club of the antenna *avila*. is yellow-brown, the wings are narrower and the forewing has beneath 7 white marginal spots, in *pharo* only **3**—4 apical spots. — **crocodes** *Bates*, from the Upper Amazon, differs from the preceding by the black collar crocodes. and patagia, which in the latter are red-brown.

N. thira *Hew.*, from Peru, has the size and markings like sylphis *Guér*. (36 a), from Bolivia, but a red-thira. yellow stripe in the distal margin of the hindwing. On the under surface both forms have yellow-brown, darkedged margins and 2 white dots in the apex.

The similar **N. verticilla** Hew. (36 a) has only a dark half-band across the discocellular and towards the verticilla. apex a smaller, white patch. — **sodalis** Hsch., which occurs together with the preceding at the boundaries of Peru sodalis. and Bolivia, is similarly marked. It has, however, a yellow base to the costal margin of the hindwing beneath, whilst in verticilla this is yellow-brown like the other margins.

18. Genus: Sais Hbn.

This small genus contains only a few forms of scarcely medium size, which are all very nearly allied and occur in northern South America, but are mostly not common. The species may be recognized by the long cell of the hindwing with feebly angled middle discocellular and by the strongly aborted forelegs of the $\mathcal{J}_{\mathcal{J}}$.

S. paraënsis Hsch. (36 c), from the Lower Amazon, has yellow-brown ground-colour; apex and 2 spots paraënsis. at the end of the cell of the forewing, as well as distal margin and median band on the hindwing, black-brown, Forewing with broad yellow oblique band. — badia Hsch. (= mosellina Stgr. i. l.), from the Upper Amazon, badia. is a large local form with chestnut-brown ground-colour and smaller yellow oblique band. — camariensis Hsch., camariensis. from British Guiana, has light yellow-brown ground-colour, a large red-brown spot in the apex of the forewing and a yellow longitudinal band at the median of the hindwing. — In rosalia Cr., the oldest form, from Surinam, rosalia. the apex is not black-brown but like the yellow-brown ground-colour. Otherwise this form is very near to paraënsis. — In the larger virchovi Dew. the apex of the forewing is black-brown and the yellow oblique band very narrow virchori. and entate. — mosella Hew. (36 c), which likewise comes from Venezuela, has a red-brown spot at the apex of the mosella. forewing, whilst the median band of the hindwing is almost entirely absent.

S. promissa Weym. and **zitella** Hew. (36 c) have broader wings and a yellow-brown apex to the forewing promissa, with black-brown marginal teeth, much as *Ceratinia pardalina*. The spots of the median band and the distalmarginal teeth of the hindwing are merged together in pairs into black stripes, so that streaks of the yellow-brown ground-colour are left between them. Both forms fly on the Upper Amazon, and promissa has a large, broad, yellow oblique band, like paraënsis, whilst in *zitella* this is short and narrow.

19 Genus: Scada Kirby.

This genus includes only a few delicate, yellow and black forms, which are almost all very similar and mostly occur in the neighbourhood of the equator. It has the forelegs of the $\Im \Im$ strongly aborted in common with the preceding genus and the superficially similar *Aeria*. It may be recognized especially by the long upper discocellular, which to some extent forms a branch of the subcostal. — In size some forms are inferior even to the true Ithomiids and are hence the smallest of the whole family.

The *Scada*-species mostly occur in the thick undergrowth in the primeval forest, only coming into the open spaces in dull weather, when they are found feeding at small, white star-shaped flowers.

The rare **S. zemira** *Hew*. (36 d), from Ecuador, is the only species which in addition to very broad black *zemira*. markings has also a red-brown double spot at the hinder angle of the forewing.

S. kusa *Hew.* has somewhat narrower margins, it differs from the normal markings in that the oblique *kusa.* band joins the inner margin of the forewing, cutting off a yellow spot at the hinder angle. It flies, like the smaller ethica *Hew.* (36 d), in Ecuador. In the latter a yellow spot at the apex of the hindwing is cut off by a blackish *ethica.* transverse band across the end of the cell, as is also the case in *Napeogenes lamia* and *lthomia derasa* from the same localities. — excellens *Srka.* is a local form from Ecuador, in which the black distal margins are almost *excellens.* entirely suppressed, the marginal dots being very large and yellow. — quotidiana *Hsch.*, from the middle Napo *quotidiana.* in Ecuador, approximates to *ethica*; but the characteristic transverse band on the hindwing is absent.

S. zibia Hew. is a similar species from Colombia and Ecuador with more pointed apex to the forewing *zibia*, and red-brown collar. — xanthina Bates (36 d) is a similar form with broader, deeper black margins and more *xanthina*, vivid yellow. It is the only Central American form; from Panama and Costa Rica. — amplificata Hsch., from amplificata eastern Colombia, is larger, with broad blackish margins and larger white marginal dots, especially at the apex of the forewing.

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DIRCENNA. By R. Haensch.

- S. philemon Fldr., from Venezuela, is said to be very similar to reckia Hbn., but to have red-brown philemon. collar and patagia.
- S. theaphia Bates (36 d), from the Lower Amazon, is the smallest species of the genus and also of the theaphia. whole family. Examples occur in which the wing-expanse is less than 30 mm. It has very delicate, yellowish balesi, wings and a straight, black oblique band at the end of the cell of the forewing. - batesi Hsch., a local form from majuscula, the Upper Amazon to Ecuador, is larger, more vividly coloured, with broader black margins. - majuscula Hsch. is a larger form from British Guiana. It has broad deep black margins and very small white marginal dots. On the under surface there is a red-brown streak in the distal margin near the inner angle.
 - S. reckia Hbn., from northern Brazil, is a smaller species and may be recognised by the absence of the reckia. white marginal dots on the upper surface. The yellow ground-colour is only slightly transparent.
 - In S. ortygia Druce (= garleppi Stgr. i. l.), from Peru, the white marginal dots are likewise absent; but ortygia. it is considerably larger with very long, pointed wings. The dark margins, especially in the 3, are very transparent: the inner margin of the forewing very broad.

20. Genus: Dircenna Dbl. & Hew.

With this begins the group of the true Ithomias, in which the lower discocellular of the hindwing forms a sharp angle with the median, so that the cell is short.

In Dircenna the palpi are strongly hairy, the cell of the hindwing is short. The forelegs of the QQ are four-jointed. The genus comprises for the most part fine-looking species with transparent wings and short antennae. Representatives of this genus are found almost everywhere from Mexico to Argentina; they are mostly not rare and some, such as klugi from Central America and dero from Brazil, are among the commonest butterflies of the respective districts.

- **D.** klugi *Hbn.* (36 e \mathcal{J} , \mathcal{Q}). The \mathcal{J} has longer hindwing and more delicate colouring, which is not sufklugi. ficiently brought out in the figure; the hindwing in the 3 is yellowish, only at the inner angle yellow-brown, not red-brown, in the Q uniformly yellow-brown. Examples from the volcano Chiriqui in Costa Rica, which chiriquensis. I therefore call chiriquensis form. nov., are distinguished from typical specimens from Mexico, Honduras, etc., by brighter colouring and also by a much broader spot in the cell of the forewing. In the 3 the distal margin of the hindwing is broadly coloured with red-brown near the dark border and proximally distinctly defined by the transparent basal part.
 - D. relata Btlr. & Druce, from Costa Rica, has a blackish base to the forewing, blackish apex to the relata oluras, hindwing and a broad, vitreous oblique band on the hindwing, especially in the Q. - olyras Fldr. (36 e) is a very similar, larger and much more brightly coloured form from Colombia, which recalls Olyras montaqui and Ceratinia excelsa by the vitreous oblique band of the hindwing, especially on the underside (which is not visible in the figure) and other markings. In the Q the hyaline spots of the forewing and the oblique band of the hindlonera, wing are yellow. - lonera Btlr. & Druce is another, similar form from Costa Rica with blackish spot at the median of the forewing and blackish veins. The disc of the hindwing is colourless. The abdomen is beneath black-brown, not yellow as in *olyras*.
 - **D.** jemina *Hbn.* $(36 \in \mathcal{J}, \mathcal{Q})$ has a dark spot in the middle of the cell of the forewing and red-brown inner *iemina*. margin and median. The hindwing in the σ is blackish at the inner margin, in the φ with spots across the dark median veins. The species varies somewhat, the ground-colour ranging from pale red-brown to yellow; it occurs bairdi, in Colombia and Venezuela, but is said also to be found in Nicaragua (= jambe Dbl. & Hew.). - bairdi Reak.

is said to be similar to *jemina*, with black inner margin of the forewing. The basal half of the hindwing is ochreous, euchytma, the distal half blackish with black veins. — euchytma Fldr. (36 f σ , φ) has shorter wings and red-brown inner

- margin. Across the cell runs a forked, black oblique band and through the cell a half-band. The hindwing has broad distal margin. The ground-colour of this wing is yellowish with red-brown veins. In Colombia and Venezuela: common.
- D. visina Hsch. (36 f), from eastern Ecuador, has almost colourless wings with very slight whitish smears, visina. as in *olyras*. The median of the forewing is broadly red-brown.
- D. suna Hsch., from western Ecuador, is a very similar, smaller species, in which only the club of the suna. antenna is yellow-brown. The spot in the cell of the forewing is linear, as in marica. In the $\hat{\varphi}$ the subcostal of the forewing is also red-brown, as well as the veins in the disc of the hindwing.
- marica **D.** marica *Fldr.* (36 f ς , ς), from Venezuela, and steinheili *Stgr.*, from Colombia, are two nearly allied steinheili. forms with black antennae. In marica the patches at the end of the cell and the apex are yellowish, in steinheili whitish.

EPITHOMIA. By R. Haensch

D. mantura *Hew.* (36 g) may be recognized by the broad band across the end of the cell of the forewing *mantura*. to the distal margin. In this it recalls some *Thyridia* and *Aprotopos*. Bolivia.

D. loreta Hsch. (36 g), from Ecuador, is a similar, larger species, without the band in the hindwing. loreta.

D. xanthophane *Hpffr.*, from Peru, has narrower, dark margins and vivid sulphur-yellow veins in the *xanthophane*. disc of the hindwing, as well as a yellow base on the underside of the wing.

D. dero *Hbn.* (= celtina *Burm.*) (36 $g \mathcal{J}, \mathfrak{Q}$) is somewhat smaller, with short, yellowish club to the *dero.* antenna. The band across the middle of the cell of the forewing is somewhat curved. In the \mathfrak{Q} the margins and bands are broader. Southern Brazil to Paraguay and Argentina; very common. — **rhoeo** *Fldr.* is an allied form *rhoeo.* from northern Brazil, with ochre-yellow colour, also on the veins, particularly in the hindwing.

D. hugia *Schaus*, from Bolivia, is said to have yellow-grey wings with brown veins and margins, which *hugia*. are broadest at the end of the veins; with yellow spots at the end of the cell and the distal margin.

D. honrathi Srka. (36 g) is a rare species from Chanchamayo in Peru, with delicate, blackish margins, *honrathi*. without spot through the cell of the forewing; with larger, whitish dots at the apex of the hindwing.

D. vandona Hsch. (37 a) recalls the similar species of Ceratinia, Napeogenes, etc., by the red-brown vandona. patch at the inner angle of the hindwing. The wings are otherwise colourless except for the yellowish base of the hindwing; the dark distal margins sharply defined. It flies together with ab. immaculata Hsch., in which immaculata, the red-brown patch at the inner angle is absent, in the eastern Andes of Ecuador at the upper Pastaza River.

D. lorica Weym., from Guiana, is a smaller, colourless species with narrow, brown margins, without lorica. band across the end of the cell of the forewing.

The beautiful **D**. varina *Hew*. (37 a), from the eastern Andes in Ecuador, is a very distinct, brightly *varina*. coloured and rare species. The base of the forewing and the hindwing are delicate red-brown; the apex of the forewing black; across the end of the cell a broad yellow macular band with 3 dark spots: all semitransparent. — In ab. partita *Hsch*, the yellow oblique band is broken up into separate spots by a black band across the end of *partita*, the cell.

D. pulcheria *Hew.*, from Ecuador, has the hindwing and the base of the forewing orange-coloured. *pulcheria*. The greater part of the forewing is blackish with yellow spots in and below the cell.

D. euteles Ersch., from Cayenne, is not known to me.

euteles.

D. lenea Cr. ($\mathcal{Q} = \text{melanida } Cr$.) (37 a \mathcal{J}, \mathcal{Q}), from the north-east of South America, has in the hindwing *lenea*. a peculiar, blackish longitudinal band, which is interrupted at the apex. Between this and the dark distal margin the colour is red-brown, proximally yellow in the \mathcal{J} , reddish in the \mathcal{Q} . The forewing has a yellow oblique band; the base is red-brown, apex and end of the cell are black. — elvira Weym. is a very similar form, in which the elvira. black and the red-brown band completely surround the apex.

D. methonella Weym. (37 a) has yellowish wings with black margins and half-band across the end of *methonella*. the cell of the forewing. Behind the end of the cell of the forewing and in the disc of the hindwing the veins are partly yellow-brown. In the \mathcal{Q} the margins are much broader and in the cell of the forewing there is a triangular spot at the median. It flies in southern Brazil and Paraguay. — xantho *Fldr.*, from Central Brazil, is a similar *xantho*. form with yellow-brown spot in the cell of the forewing, yellow-brown veins in the hindwing and stronger yellow dusting. Larva according to W. Müller on Solanum; the body is cylindrical, without appendages, greenish, the head very large. The pupa is short, at the ventral side strongly convex, transparent green, the greater part with a golden gloss. — **D. hulda** *Fldr.*, from Venezuela, is said to be similar to *xantho*, but larger, with narrower *hulda*. subapical spots in the forewing and without yellow-brown in the cell.

In **D. obfuscata** *Btlr.*, from the Upper Amazon, the base of the forewing is black. The spots at the distal *obfuscata*. margin yellowish. Hindwing near the base of the inner margin with large, transparent brownish spot and 2 smaller ones at the apex.

D. zelie *Guér.*, from Bolivia, is said to be allied to *dero*, with black margins and band across the end *zelie*. of the cell. Veins at the base of the hindwing yellow.

D. epidero Bates, from the Amazons, has on the hindwing from the costal to the distal margin a black epidero.
 transverse band, like *Thyridia confusa*; in the cell of the forewing a triangular, black spot is placed at the median.
 In ab. signata ab. nov. Stgr. i. l. (37 b) there are red-brown spots in the black distal margin of the hindwing, signata.
 sometimes also at the base of the forewing.

21. Genus: Epithomia Godm. & Salv.

This genus only contains a few forms, which were formerly placed in *Dircenna*. The species are distinguishable especially by the short hairy palpi, the 5-jointed tarsi of the $\varphi \varphi$, and also by the presence of the upper discocel-

ITHOMIA. By R. Haensch.

lular in the hindwing. Superficially they resembles some species of Callithomia, Ithomia and Calloleria. Their area of distribution is confined to north-west South America and Panama.

agrippina. **E.** agrippina Hew. (= callipero Bates, \mathcal{Q} balboa Bates) is the same size as the figured alpho. Base of the forewing and the hindwing red-brown, the latter with broad, dark margin. Forewing with 2 yellow oblique bands across the end of the cell and at the apex, as well as a spot between these at the distal margin. The rest of the apical half is blackish, also a spot in the cell. The species flies in Colombia and Panama. - In a form *fumantis.* from Colombia, which I call fumantis form. nov., the dark margin of the hindwing is proximally spot-like, irregular, widened almost to the cell. The ground-colour is darker. The white marginal spots of the under surface are very large.

alpho. E. alpho Fldr. (37 b) has semitransparent wings with diffuse, yellow-brown colouring and similar markings to agrippina. — In a form which like alpho comes from Venezuela, there is a median band in the hindwing which nikita. is composed of 3 angular, dark spots. I call this form nikita form. nov.

22. Genus: Ithomia Hbn.

Formerly most of the small, transparent forms of the family were included under this name. At the present time we understand by it a smaller, but still numerous group whose best distinguishing characters are the large, oval scent-spot of the 33 and the long cell of the hindwing with angled lower discocellular. Very striking in many 33, e. g. hyala (37 c), are the large broad forewing and small hindwing; in the latter the costal margin is strongly arched anteriorly by the scent-spot. In the φ the cell of the hindwing is cut off rather straight, a vein extending into the cell. The variety of colour and form in this genus is very great; it contains both gay-coloured species which closely resemble certain Ceratinia and Napeogenes and also inconspicuous, colourless forms, which are mimicked by species in the following genera. The area of distribution of the genus is correspondingly also a very large one, including the whole of the Neotropical Region. North-Western South America, however, produces the most representatives of this, as also of other genera.

heraldica. I. heraldica Bates (37 b), from Costa Rica, has black-brown forewing with red-brown base, 3 yellowish plaginota, macular oblique bands and whitish subapical dots. The hindwing is red-brown with dark distal margin. - plaginota Btlr. & Druce (37 b) is a similar, larger and more brightly coloured form from the same district. In it the yellow subapical and marginal dots are more strongly developed; but of the oblique bands only the distal one and the half of the median band in the cell are yellow. The base of the forewing is more broadly red-brown.

celemia. In I. celemia Hew. (37 c), from Colombia, the oblique bands are broken up into smaller spots. The lurida. distal margin of the hindwing is broader and in it are placed vellow dots. - lurida Hsch. is a local form of the preceding from the Cauca Valley in Colombia with very large, band-like spots in the disc of the forewing and candescens. large dots in the apex of the forewing and the distal margin of the hindwing. - candescens Hsch. is a form of splendens. celemia from Colombia and Venezuela with white instead of vellow spots and dots. - splendens Hsch. is coloured like candescens, but with very large, white spots and dots, corresponding to lurida.

iphianassa. I. iphianassa Dbl. & Hew. is a somewhat smaller, very variable species, of which anaphissa (37 c), panamensis (37 c) and others are merely local forms. iphianassa, from Venezuela, best represents the Lycoreahabitus and the pattern of the other forms can be derived from it. The scheme of markings is the same as in anaphissa, but the base of the forewing and the hindwing yellow-brown. The latter with undulate distal margin and black-brown longitudinal band, bent in hook-shape at the apex. The basal area, especially in the \mathcal{J} , is lighter yellowish, semitransparent, with dark dots at the end of the cell. The forewing has an indistinct, yellowbrown median band and a yellow subapical band; between them is placed at the distal margin a roundish, yellowish spot. The rest of the apex and 2 spots in the basal part are black-brown; apex with 2 or more whitish marginal anaphissa. dots. - In anaphissa H.-Schäff. (= pepita Oberth.) (37 c), from Colombia, the distal margin of the hindwing and the median band are united into a broad, black distal margin; also the apical half of the forewing is more panamensis, broadly black with larger, white marginal dots. - panamensis Bates (37 c), from Panama, has a much broader, dark distal margin to the hindwing, which reaches to the end of the cell. The yellow subapical band of the forewing lycaste, is entirely suppressed except for 4 very small spots. This form strongly recalls Mechanitis macrinus. --- lycaste F. negrita. is a very similar form from Kansas in North America with still more strongly black markings. - negrita Reak., from California, is another allied form, in which the black median spot of the forewing is enlarged, half of it boucardi. being on the hindwing. - In boucardi Druce, from Panama, the yellow median band of the forewing is absent. The whole basal half is yellow-brown with large, black median spot. The broad distal margin of the hindwing pumensis. and a spot at the end of the cell are black. — As pumensis REAKIRT designates a form of iphianassa, from Venezuela, with larger black spots and red-brown basal part, without the yellow median band. The yellowish spot at the distal margin is very small. The forewing has 3 white dots at the distal margin.

ITHOMIA. By R. Haensch.

I. phanessa H.-Schäff. and alienassa Hsch. (37 d), from Colombia, have transparent yellowish wings. phanessa phanessa has broad, yellow-brown submarginal distal border to the hindwing and in the cell of the forewing an isolated, triangular spot. In alienassa the distal margin of the hindwing is black-brown with red-brown macular streak, and across the middle of the cell of the forewing there is a dark half-band.

I. cleora *Hew.* (= chimborazana *Reak.*, spruceana *Bates*) (37 c \mathcal{J} , \mathcal{Q}), from western Ecuador, was *cleora*. formerly often confused with the preceding two. It may, however, be recognised at once by the long, pointed, black spot in the cell of the hindwing. On the other hand the red-brown colouring varies very much. There are $\mathcal{J}\mathcal{J}$ in which this is almost entirely absent and $\mathcal{Q}\mathcal{Q}$ in which the basal half of the forewing and of the hindwing are almost entirely red-brown.

1. epona Hev. (37 d) has transparent smoke-brown wings with darker margins; half-band across the epona. end of the cell of the forewing, as well as median spot in the cell. In the Q the distal margin of the hindwing is broader, with whitish dots. The species flies in the mountains of eastern Ecuador at elevations of 1500-3000 metres together with the similar Dismenitis hewitsoni.

I. xenos Bates (37 d) is a similar species with narrower wings, from Costa Rica. The forewing has slightly *xenos*, yellowish patch and a dark half-band through the middle of the cell. The distal border of the hindwing in the \mathcal{J} is very narrow. In the rare \mathcal{Q} the margins and patches are broader, at the median of the forewing and on the hindwing proximally red-brown.

1. ulla Hew. (= radata Weym.) (37 e) is another species from Colombia, but with peculiar neuration. ulla. BOISDEVAL erected for it the genus Tagyris. The forewing is very broad; the discocellulars close the cell in arcshape and form an acute angle with the very small third section of the median vein. The scent-spot of the hindwing terminates with a neck at the end of the cell, as in Hypoleria-species. ulla has behind the band at the end of the cell of the forewing a yellowish patch and a yellow-brown subcostal. In the φ the margins are broader and there is also a half-band across the end of the cell of the hindwing. — The same neuration is found in **dimidiata** Stgr., dimidiata. from the Cauca Valley and eastern Ecuador. This species has slightly smoke-brown wings with brown margins, but without half-band across the end of the cell and without yellow patch.

Another similar species is **I. mira** Stgr., from the Amazons, but with different neuration, red-brown mira. subcostal and small spot at the end of the cell of the forewing.

I. peruana Salv. (= abendrothi Hpfr.) (37 d) has transparent, yellowish wings with broad, black margins *peruana*. and half-bands across the end of the cell and through the cell of the forewing. It occurs at Chanchamayo in eastern Peru.

1. linda Hew. (37 d). from Ecuador, has exactly the appearance of Ceratinia antea and Napeogenes glycera, linda, with which it also flies in company. It is somewhat smaller and the \mathcal{J} is conspicuous by the broad costal margin of the hindwing. — theuda Hew., likewise from Ecuador, is a very similar species with somewhat yellowish wings theuda, and black antenna, whilst in true linda the club of the antenna is yellowish.

1. nigrimargo *Btlr.*, from Ecuador, approximates to the preceding, but has a red-brown spot at the anal *nigrimargo*. angle of the hindwing and is hence very similar to *Ceratinia adelinda* and other forms.

I. lagusa Hew., from Colombia, and I. hymettia Stgr. (37 d), from the Cauca Valley, strongly recall lagusa. certain Napeogenes-species. The neuration of the \Im almost exactly agrees with that of this genus in the long cell of the hindwing with the lower discocellular only weakly curved proximad. The forms may, however, be recognized with certainty by the scent-spot of the \Im and the recurrent cell-vein in the \Im . In lagusa \Im the basal third of the forewing is black-brown with oblong yellow-brown spot and broad half-band at the end of the cell. In the \Im the base are narrower, at the apex and at the distal margin of the hindwing on the contrary broader. hymettia has colourless wings, broad inner margin to the forewing and yellow-brown streak at the median; further a half-band at the end of the cell and in the \Im narrow, in the \Im broad, dark margins to both wings.

The beautiful **I. ellara** Hew. (37 e), from Bolivia, has colourless wings with broad black margins and ellara. patches at the end of the cell and in the cell of the forewing, and large, transparent marginal spots. On the under surface the markings are for the most part brown-red. The antenna has a yellow-brown club. — The very similar eleonora Hsch., from the border of Peru and Bolivia, has narrower distal margins, without the transparent eleonora. marginal spots, but at the costal margin of the forewing a suggestion of a subapical band, and also black antenna. — In an aberration, which I call ab. beata ab. nov., there is a large, yellow-brown spot in the distal margin at the beata inner angle of the hindwing above. — avella Hew. ($\mathcal{Q} = \text{cesleria} Hew$.) (37 e), from Colombia, is a similar, smaller avella. species with red-brown subcostal to the forewing and without the dark colouring in the cell of the hindwing. The σ has considerably narrower margins and patches than the figured \mathcal{Q} .

The \mathcal{J} of **1**. hyala Hew. (37 e) is conspicuous by the broad forewing and small hindwing. The wings are hyala. slightly smoke-brown with dark margins and 2 half-bands through the cell and at its end. The base of the hindwing is yellow beneath. In the \mathcal{Q} the wings have the usual shape, somewhat as in *diasia*.

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142

ITHOMIA. By R. Haensch.

- diasia. I. diasia Hew. (37 f) is a similarly marked species, without the striking forewing of the 33, with glossy bluish wings margined with black. On the under surface the margins in this species are also black in exceptional cases except for the costal margin of the hindwing, which is brown and at the base yellow.
- ossuna. As I. ossuna spec. nov. I designate an interesting species from Colombia, which is similar in pattern and colouring to the preceding species except for the distal margin of the forewing. This is much widened before the inner angle and red-brown.
- hippocrenis. I. hippocrenis Bates, from southern Central America, is similar to diasia, but has a much broader spot at the end of the cell of the forewing and also a white patch, as well as red-brown margins on the under surface. morewa. morena Hsch. is another similar form from western Ecuador. The wings are colourless; the markings as in diasia, only the half-band in the cell is reduced, and the margins are beneath red-brown with dark edges.
 - actia. I. actia Hew. (= centromaculata Weym.) (37 g) has whitish-dusted forewing with dark margins and veins, as well as broad band across the end of the cell of the forewing. The hindwing is light red-brown with dark costal and distal margins. This rare species flies in Eastern Colombia.
 - jucunda. I. jucunda Godm. & Salv., from Panama, has similar forewing, but colourless hindwing with broad, black-brown distal margin and a red-brown spot in it near the inner angle. The species thus recalls ossuna and galata. is distinguished by the absence of the half-band in the cell of the forewing. galata Hew., from Colombia, is also similar, with narrower band at the end of the cell of the forewing, and moreover yellow-brown, dark-edged distal margin to the hindwing.
 - patilla. I. patilla Hew. (= psyche Bates) (37 f), from Central America, has a black-brown apical half to the forewing with a large white subapical patch; the base and the hindwing are colourless, with dark red-brown leila. margins. leila Hew., from Mexico, is larger, with broader bands and spots, and white dots in the apex of the forewing and at the distal margin of the hindwing.
 - terra. terrana.
 I. terra Hew. (37 f), as well as terrana Hsch. and a third form, which I call vulcana form. nov., may be vulcana. recognized by the broadly dark-margined veins at the end of the cell of the hindwing. terra is one of the most widely distributed and commonest Ithomias; it occurs in north-western South America, from Colombia and Venezuela to Bolivia. The wings are transparent, shiny bluish, with triangular, black spot at the end of the cell of the forewing and small white spots near it at the costal margin. The black margins of the upper surface are beneath red-brown with dark edges. Whilst terra occurs in the eastern part of the Andes in Ecuador, the smaller terrana is found in the west. The wings in this form are colourless, with broader margins and large, white patch at the apex of the forewing. On the under surface the colour of the margins is yellow-brown. vulcana, from Costa Rica, has the colouring as terrana. On the under surface the margins are yellow-brown with fine, dark border. The scent-spot of the *d* in vulcana is yellow-brown, in the other two forms black-brown.
 - derasa. I. derasa Hew. (= mellilla Weym., soligena Weym.) (37 f) has dark-shaded veins at the end of the cell of the hindwing, like the very similar Napeogenes lamia and Scada ethica, which species likewise have yellow-dusted wings. derasa was described by HEWITSON from Nicaragua. But I find no difference between it and the travella. form described from eastern Ecuador by WEYMER as soligena. From thence also comes travella Hsch., which is similar to the preceding; but the dark marking at the end of the cell of the hindwing is absent and the band
 - salapia. at the end of the cell of the forewing is broader. salapia Hew. (37 f) has the wings more weakly dusted with yellow and broader, black margins, without white dots in the anal margin and with red-brown central line in the margins of the underside.
 - drymo. 1. drymo Hbn. (= diaphana Cr., phono Geyer) (37 g ♂, ♀) is a small, inconspicuous species, common in Brazil, with colourless, dark-margined wings and broad half-band across the end of the cell of the forewing. At the costal margin follows a small, white spot. In the ♀ the margins are somewhat broader and across the napho. end of the cell of the hindwing is placed a triangular, dark spot. napho H.-Schäff. (= phono Hew. p., naxo Oberth.), from Colombia, is a very similar form with slightly smoke-brown wings and without the spot at the pellucida. discocellular of the hindwing in both sexes. pellucida Weym. is also a very similar species with longer oblique band at the end of the cell of the forewing. It is said to occur both on Trinidad and in Brazil.
 - *agnosia.* **I. agnosia** *Hew.* (37 f), from Colombia and Venezuela to Peru, is a common species with similar markings to the preceding, but distinguishable by the large, white patch at the end of the cell of the forewing.
 - pseudoagalla. spot at the end of the cell and yellow-brown median vein on the forewing.
 - ocenanthe. I. ocenanthe Weym. (37 g) has more pointed forewing with brownish margins, which are vivid yellowbrown on the under surface. The half-band at the end of the cell of the forewing is pointed. It flies in the Cauca Valley of Colombia and is closely allied to *terra*.
 - salcata. I. salcata Schaus, from Colombia, is said to have transparent, whitish wings, with black-brown veins and margins. Forewing sparsely scaled with white at the end of the cell and the costal margin. On the under

CALLOLERIA. By R. Haensch.

surface the margins are light reddish brown with dark edges; forewing with 3 white apical spots. Hindwing yellowish at the costal margin, at the distal margin with small, white dots.

Whilst in the forms already dealt with the dark oblique band of the forewing was more or less distinctly forked, in the following otherwise similar species it is simple, tapering to a point posteriorly.

I. amarilla *Hsch.* (37 g) has very similar markings and colouring to *travella*, but the oblique band is *amarilla*. gradually pointed posteriorly. It flies with the latter on the upper Napo.

I. aquinia *Hpffr.*, from Peru, is very similar to *salapia*, but with a simple oblique band. The 3rd median *aquinia*. vein is not darkly coloured.

I. ardea *Hew*. (38 a) is very similar to *agnosia*, with the oblique band on the forewing prolonged to the *ardea*. distal margin. It varies much in size and flies in Bolivia.

I. drogheda and hamlini Weeks, from Venezuela, are not known to me.

23. Genus: Calloleria Godm. & Salv.

Here belong a number of smaller forms which are almost all nearly allied and have mostly a red-brown ground-colour, with yellow oblique band on the forewing. The neuration of the 33 shows in the hindwing between costal and subcostal on the under surface a raised ridge, as well as an indistinctly angled lower discocellular with very long lower and very short upper divisions, so that it appears almost without angle; moreover with recurrent cell-veins as continuation of the lower radial. In the Q the neuration is very similar except for the raised ridge.

The area of distribution extends over northern South America and the Isthmus of Panama to Costa Rica.

C. dorilla Bates (38 a), from Panama and Costa Rica, has between the red-brown base and the blackbrown apex an irregular, yellow oblique band which is connected with a yellow spot placed at the inner margin. The triangular, dark spot in the middle of the cell is mostly only indistinct; on the other hand the two at the end of the cell are very large and connected. In the apex are placed a larger and a smaller yellow spot, as well as several yellow dots at the distal margin. The hindwing is red-brown with dark distal margin and spot at the end of the cell. — The very similar **azara** Hew. (38 a), from eastern Ecuador and Colombia, has lighter, narrower *azara*. wings. The two spots at the end of the cell are smaller than in *dorilla*, so that the yellow oblique band is broader at the costal margin. Only one of the yellow dots at the distal margin is present here. The distal border of the hindwing is broader. — **tutia** Hew. (38 a) has even more transparent wings with narrower yellow oblique band and smaller apical spots; between the two appears another large, transparent, yellowish subapical spot. The hindwing has narrow distal margin and a distinct longitudinal band. This form flies in Venezuela and Costa Rica. — **tosca** Schaus, from Colombia, is a local form with yellow apet to the forewing and yellow colour between the median band of the hindwing and the distal margin. — **chanchamaya** Hsch. has similar markings to *tutia*, without the yellow spots in the apex of the forewing, with stronger, black macular band in the disc of the hindwing and yellowish colouring between the disc and the costal margin. It flies at Chanchamayo in Peru.

In true **C. hopfferi** Weym. the yellow oblique band in the forewing is absent, the specimen figured represents hopfferi. a local form, which I call **onoma** form. nov. (38 a). Both forms fly on the Upper Amazon; they may be recognised onoma. by the red-brown colour of the large subapical spot of the forewing and resemble *Ceratinia pardalis* resp. tiarina. The marking is otherwise similar to that of *chanchamaya*. The distal margin of the hindwing, especially in hopfferi, is broken up into several spots.

C. poecila Bates (38 a) is a commoner, widely distributed species from Colombia, Ecuador and the *poecila*. Upper Amazon. It has a broad, distally dentate yellow oblique band and at the end of the cell 2 separated, roundish black spots. — **callichroma** is the name given by STAUDINGER to a form of *poecila* from Ecuador with narrow, yellow *callichroma*. band. — In **poecilana** *Hsch.*, from eastern Ecuador, the median band of the hindwing is united with the distal margin into a large, blackish spot. — In **azarina** *Weym.*, also from Ecuador, there is a large black spot in the *azarina*. *uigronas*black except the apex, which remains red-brown.

C. sclenides *Weym.* (38 a), from the Upper Amazon, has a yellow oblique band, widened in the middle *selenides.* towards the apex, which is also proximally bordered with black. The broad median band of the hindwing is continuous.

C. porrecta *Hsch.*, from Bolivia, has longer, narrower wings, narrow yellow oblique band, similar to *porrecta*. *tutia*, and large blackish spots at the end of the cell. The hindwing has 3—4 sagittate spots in the disc. In the blackish apex of the forewing is placed a lighter, sometimes yellow-brown patch.

C. robusta *Hsch.*, from Bolivia, is the same size as *dorilla*. The narrow, yellow oblique band is broken *robusta*. up into 2 spots. The hindwing is narrow, with dark margin. — In **fuscens** *Hsch*, the oblique band is also broken *fuscens*. up into spots, but its colour is the same as the ground-colour: transparent, faintly red-brown. The hindwing has 3 sagittate spots in the disc and narrow, proximally dentate distal border.

drogheda. hamlini.

singularis.

HYPOSCADA. By R. Haenseh.

C. singularis *Reb.* is a form from western Ecuador with narrow, delicate wings. The yellow oblique band is narrow, not dentate towards the apex, provided with a projection towards the base. The median band of the forewing is broad, shadowy. The antenna is dark with brownish club.

melanoptera.

C. melanoptera Hew., from Ecuador, is a peculiar form with blackish wings, the cells of which are transparent vellowish brown, as also 3 larger spots at the distal margin of the forewing. On the under surface there are some quadrate reddish spots at the distal margin of the hindwing. It appears to be a melanistic aberration.

C. nise Cr. (φ = selene Cr.) (38 b ς , φ) has a yellowish, broad oblique band in the forewing, reaching nise. to the inner angle, where it is strongly denticulate. The ground-colour in the 3 is faintly red-brown, in the φ dark red-brown. The hindwing has a narrow median band, which is connected with the costal margin in bow-shape and in the 3 forms the border of a transparent, light longitudinal band. nise flies on the Lower Amazon, as well as in Guiana and Venezuela. — peruensis Hsch. (38 b) is a similar form from the Upper Amazon, from Peru. The ground-colour is light red-brown in both sexes, with transparent longitudinal band at the base of the hindwing. The yellow oblique band of the forewing is still broader, not transparent, with small dark spots at the end of espriella. the cell. The dark spot in the cell is very faint. - espriella Hew., from Ecuador, is a more strongly coloured tarapolis. form with dark apex to the forewing, without the transparent longitudinal band in the hindwing. - As tarapotis form. nov. I designate a form from the Lower Amazon, in which the yellow oblique band is almost entirely absent except for an indistinct spot at the costal margin. The colour, as in espriella, is vivid red-brown to the apex.

- In C. radiosa Hsch., from eastern Ecuador, the apical half of the forewing is blackish, with radiate, radiosa yellow macular band. The dark spot at the base is elongate-pointed. The hindwing has a macular median band and dentate, dark distal margin.
- C. cayana Salv. (38 b), from Guiana, has in the blackish apex a peculiarly formed, yellow oblique band cayana. with approximated spot at the inner angle. The spot in the cell is absent. The hindwing has a broad median band and both wings whitish marginal dots.
- C. jolaia Hew. (38 b), from Colombia, resembles Napeogenes stella. In the disc of the forewing there jolaia. are a number of yellow spots, and in the distal margin of both wings large, yellow marginal dots; in the cell of the forewing a black, rounded spot and at the apex of the hindwing the commencement of a median band. -conveniens. In ab. conveniens Hsch. the spots in the forewing are united into an angular band at the end of the cell.

C. doto Hbn. (38 b), from the Lower Amazon, is a very aberrant species with diaphanous wings; the doto.

margins and the discocellular of the forewing are margined with dark. The median of the forewing and a broad submarginal band on the hindwing are yellow-brown.

24. Genus: Hyposcada Godm. & Salv.

It is not possible to differentiate this genus very sharply from *Leucothyris*, as there is a gradual transition in the characters. Thus a number of forms which approximate to one another, as ilerdina and ina, have been placed in two different genera. I therefore only leave in this genus the forms which are allied to the typical species and place the others with the similar forms of Leucothyris.

Huposcada is distinguishable by the long, thin antennae and the short cell of the hindwing. Costal and subcostal run at a distance from one another. Upper and middle discocellulars of the hindwing are short and almost equal in length. They are medium-sized butterflies of mostly red-brown ground-colour, which recall many species of Ceratinia. They occur especially in north-west South America, some also in Central America and are for the most part not common.

- H. adelphina Bates (38 c), from Colombia and Panama, has a broad, red-brown base to the forewing adelphina. and red-brown hindwing with broad black distal margin. The rest of the forewing is black with a large number of white spots. Also at the apex of the hindwing are placed 2-3 white dots. The under surface is similarly marked to the upper. - virginiana Hew., from Mexico and northern Central America, has narrower wings. The virginiana. red-brown colour of the forewing reaches nearly to the end of the cell and the two white spots there are small and roundish. Especially worthy of note is the under surface, which is brown also in the whole apex of the foreevanides, wing. - In a third form, from Costa Rica, which I call evanides form. nov., the ground-colour of the forewing is black-brown except for two red-brown streaks at the base, and the same beneath. The wings are narrow as in virginiana, the white spots as in adelphina.
- H. consobring Godm. & Salv. (38 c) is similar to the preceding, with larger, yellowish spots, without consobrina. the two spots in the end of the cell of the forewing. It flies in eastern Ecuador, at the foot of the Andes.
 - H. anchiala Hew., from the Upper Amazon to Peru and Ecuador, has smaller white spots in the black anchiala. apical half and a black streak at the median of the forewing, as well as black margins to the hindwing and a broad, spot-like median band in the disc.

nervensis

Publ. 30, VII. 1909.

H. abida *Hew.*, from Colombia, is similar, somewhat smaller, without black streak over the median of *abida*. the forewing, with narrower median band on the hindwing. Both wings have small white marginal dots.

H. kezia *Hew.*, from the Upper Amazon, has the markings like *anchiala*. But in the apex of the forewing *kezia*, there are only three white spots, the others are replaced by an irregular, yellow-brown band at the end of the cell. — In **rezia** *Hsch*. (38 c) the whole apex of the forewing is also yellow-brown except for the three indistinct whitish *rezia*. spots, to each of which a black oblong spot is joined. This form flies on the Ucayali.

H. fallax Stgr. (38 c) is an interesting species from Chanchamayo in Peru, which strongly resembles fallax. Ceratinia bicolora and semifulva, as well as the larger Mechanitis deceptus and Melinaea mothone, by the black wings with broad red-brown bands. But it may be recognised, apart from the neuration, by the long, thin black antenna and the differently placed black spots situated at the end of the cell and in the cell of the forewing.

H. acsion Godm. & Salv., from Panama, is similar to *abida*, smaller, without the white marginal dots *aesion*. and without the median band on the hindwing.

H. illinissa *Hew.*, from the Upper Amazon, is similar to the preceding, with larger white spots and an *illinissa*. additional one in the cell of the forewing. The red-brown hindwing has in addition to the dark border a black submarginal band, curved correspondingly to the distal margin.

In **H.** similia *H.*-Schäff. (38 d) the whole base of both wings is black-brown like the hindwing; on the similia. hindwing remains only a yellow-brown submarginal band at the distal margin.

25. Genus: Leucothyris Bdv.

This genus is as at present constituted rather extensive and might better be divided into several subgenera. Externally two principal groups are already differentiated: the first has shorter, rounded wings with broad whitish bands, often also with red-brown colour, especially at the apex of the forewing. The second has more pointed apex and peculiar whitish macular marking, especially at the apex and at the distal margin of the forewing, without brownish colouring. In the neuration, however, both forms fluctuate between the typical short Hyposcada-cell of the hindwing and long thin antenna and long cell and shorter antenna with distinct club. In typical Leucothyris the costal and subcostal are said to run close together. The cell of the hindwing in the 3° is longer anteriorly than posteriorly; the middle discocellular longer than the upper.

Considering the large number of forms which belong here it is not surprising that representatives of the genus are found in the whole Neotropical region; but as in most Ithomiids, the eastern slopes of the Andes from Colombia to Bolivia produce the greatest abundance of forms. The range of distribution of the separate forms is mostly very restricted. Almost every large river-valley has its distinct local form, which sometimes occurs there in great abundance, but a few hundred metres higher or lower, or about 10 miles to either side, is no longer met with.

On this account some forms of this and other genera remain for decades great rarities, until the restricted locality is at last revisited by some collector, who then obtains the coveted species in abundance.

L. ida Hsch. (38 d), from the Upper Napo in Ecuador, has black wings with milky vitreous spots and *ida*. a red-brown submarginal band on both wings. The latter is very broad in the apex of the forewing, as is also the case in a large number of similar forms. *ida* is distinguishable especially by the two white dots in the apex of the forewing, moreover the forewing has four white spots and a triangle at the base. The hindwing has a large whitish discal longitudinal band. In the \Im the spots and band are smaller. — *idina Hsch*. is a smaller local *idina*. form from the Upper Amazon with indistinct dots in the apex of the forewing and broader, light red-brown apical band. Moreover, on the hindwing the red-brown submarginal band is lighter and broader. — **kena** Hew., from kena. eastern Ecuador, is considerably smaller than *ida*. The two vitreous spots at the apex of the forewing are confluent and completely enclosed by the red-brown subapical band. At the end of the cell three vitreous spots form an oblique band and the other three spots are also larger. — In **ilerdinoides** Stgr. (38 d) the two vitreous spots *ilerdinoides*. at the apex are absent, on the other hand there are two at the end of the cell. The red-brown subapical band of the forewing is broader. — Another similar form, which I call **lerda** form. nov., differs from the preceding in *lerda*. having only one spot at the end of the cell of the other hand there is another at the lower angle of the cell in the disc. These forms fly on the Upper Amazon, but each of them probably occurs in a separate district.

Whilst the preceding forms have a short cell, like *Hyposcada*, in the following, otherwise very similar forms, the middle discocellular of the forewing, and hence also the cell, begins to be apppreciably longer anteriorly.

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146

LEUCOTHYRIS. By R. Haensch.

- *ilerdina.* **L. ilerdina** *Hew.* (38 d), from Peru, which is regarded as type of the genus *Leucothyris*, differs superficially from *ilerdinoides* in the absence of the two vitreous spots at the end of the cell of the forewing.
- lerida. L. lerida Kirby is similar to kena, but without the two apical vitreous spots. It flies on the Lower Napo.
- *lerdina.* **L. lerdina** Stgr. (38 d), from Pebas on the Upper Amazon, is smaller than *ilerdina*. In it the two vitreous spots in the end of the cell and at the hinder angle of the forewing are united into a broad oblique band.
- *lubilerda.* **L. lubilerda** *Hsch.*, from eastern Colombia, is a similarly marked species, but may be recognised at once by the transparent vitreous spots, which in the other forms have a milky dusting.
 - *ilerda.* L. ilerda *Hew.*, also from eastern Colombia, is a form similar to *ilerdina*, without the vitreous spot in the red-brown band.

In the following forms the red-brown subapical band of the forewing is much narrower.

Sexmaculata Hsch. (38 d), from the Upper Napo in Ecuador, has 6 vitreous spots in the forewing, namely besides the two in the cell: one at the end of the cell, one at the hinder angle and 2 smaller ones at the confluens. Iota.
Interpret distal margin. — In confluens Hsch., from the Napo, there are only 5 spots, and in lota Hew. (38 e) only 4. The latter form occurs at the base of the eastern Andes in Ecuador. It has a posteriorly forked, dark oblique band at the end of the cell, which in confluens is moreover connected with the inner margin, so that in the latter cscura. a further vitreous spot is separated off. — escura Hsch. is a darkened form of lota, without the red-brown markings on the upper surface, and with brown-red instead of yellow-red colour on the under surface. The whitish dusting praemona. of the vitreous spots is weaker. — A form nearly allied to escura, from the Upper Amazon, which I call praemona form. nov., is distinguished by much broader black margins and bands. The costal and distal margins of the hindwing especially are much widened and leave in the disc only a vitreous longitudinal band, which is broader at the inner margin, as in epicharme (38 e).

agarista. L. agarista Fldr. (38 e). The red-brown colour is mostly much lighter than in the figure. This form may be recognised by the two large, connected vitreous spots in the apex of the forewing. It flies on the upper janarilla. Rio Negro and the Upper Rio Napo. — janarilla Hew. is a very similar form from eastern Ecuador and Peru,

without the red-brown colour on the upper surface, and without the whitish dusting in the disc of the hindwing.

- priscilla. gunilla. L. priscilla Hew. (38 f) and gunilla Hew., both from the Upper Amazon (Rio Juruá, Fonte Boa), are two rare, brightly coloured forms, with red-brown hindwing. priscilla has a submarginal band in addition to the dark distal margin on the hindwing. In gunilla only the commencement of this band is present in the apex. priscilla has in the dark brown forewing 4 vitreous spots and a basal triangle; in gunilla the vitreous spot at the hinder angle is wanting, the basal area is more extended and of a red-brown colour.
 - *tigilla.* L. tigilla Weym. (38 e) is a larger species from eastern Ecuador of similar appearance to *lota*, but without the fork of the oblique band and with broader wings.
- assimilis. L. assimilis Hsch. is a very similar species from the same district, somewhat smaller, without the white spot at the costal margin and end of the cell of the forewing. The markings of the two forms also differ somewhat in other details. But they may be recognised especially by the neuration. The middle discocellular of the hindwing is considerably larger in assimilis, and the cell is consequently much larger.
 - zelica. L. zelica Hew. (38 f), from the western Andes of Ecuador, may be recognised by the yellowish colour of both wings. The pattern of the otherwise blackish apical half of the forewing consists of two subapical dots and two larger whitish spots at the end of the cell and the hinder angle. The hindwing is very broadly margined pagasa. with black. A similar form is pagasa Druce, from Panama and Costa Rica. The hindwing is like that of zelica, but the forewing has a broad band through the cell. The subapical spots are larger.
- aegle. L. aegle F. (= hippodamia Hew.) (38 f). The wings are almost diaphanous with dark margins. In the forewing some oblique bands divide the vitreous area into a number of spots, namely besides the two in the cell: one each at the end of the cell and the hinder angle, as well as 2 smaller ones and 1—2 dots at the distal margin. A red-brown stripe traverses the distal margin of the hindwing. The species flies with the similar following form zarepha. in Guiana. zarepha Hew. (38 f) has at the end of the cell of the forewing a band-like row of spots to the hinder angle and 2 vitreous spots in the apex. On the under surface the white marginal dots are absent. Guiana.
- dolabella. L. dolabella Hew. (38 e), from Bolivia, has a broad, white oblique band at the end of the cell of the forewing and a double spot at the apex; across the cell runs an incomplete, dark oblique band. The vitreous brisolis. spots and the disc of the hindwing are dusted with white. As brisolis form. nov. I designate another form, likewise from Bolivia, with narrow white oblique band on the forewing, especially at the end of the cell. The dark distal margin of the hindwing is strongly widened proximally.

LEUCOTHYRIS. By R. Haensch.

I give the name of **flexibilis** spec. nov. to a species from northern Peru which is similar to dolabella. It is smaller *flexibilis*. - and has a narrower whitish oblique band, constricted in the middle. At the hinder angle of the forewing is placed an oblong vitreous spot, as in *crispinilla*, from which *flexibilis* is distinguished by the double spot in the apex. — From Bolivia comes another very similar form, which I call virina form. nov. It has a white oblique band like virina. dolabella, but the other vitreous spots are colourless, not dusted with white. At the hinder angle of the forewing there is a vitreous spot as in *flexibilis*, but the black oblique band across the end of the cell is quite narrow, linear from the median onwards.

L. perspicua *Btlr.* (38 e) is very similar to *janarilla*, considerably larger, with subapical band instead *perspicua*. of the double spot, and also a pear-shaped spot at the hinder angle of the forewing. It flies with the allied *`onega* and *epicharme* at the Upper Amazon. — **onega** *Har*, has a broader white oblique band on the forewing and the *onega*. hindwing is black with a narrow, curved vitreous band behind the middle, which is shaded with dark at the inner margin. — In **epicharme** *Fldr.* (38 e) the vitreous band of the hindwing is broader, wedge-shaped, broadest at *epicharme*. the inner margin.

L. amazona Hsch., from the Upper Amazon, is similar to the preceding, with uniformly broad oblique amazona, band on the forewing, without the vitreous spot at the hinder angle. — Another similar form, which I call ramona form. nov., has colourless vitreous spots except for the white oblique band, the spot at the hinder angle being elongatequadrate. The median band of the hindwing is narrowest in the middle, the broad costal margin forming an angle at the 2nd median vein. It flies near Sara-yacu on the Ucayali.

L. crispinilla Hpffr. (38 e), from eastern Peru, is distinguished from the preceding by whitish dusting crispinilla. and narrow black costal margin to the hindwing, which does not enter the cell.

A species very similar to the preceding, which I call **L. enania** spec. nov., flies also in Peru. It is appreciably *enania*. smaller and has different neuration, as well as narrower bands and margins. Especially noteworthy is the black streak across the cell of the forewing, which is here placed in the prolongation of the 1st median vein, whilst in *crispinilla* it is nearer to the base.

L. didymaea *Hew.*, from Boliviá, has a similar pattern to *virina*, without the double spot in the apex *didymaea*. of the forewing. It may be recognised by the black oblique band across the end of the cell of the forewing, which forms a streak from the median to the distal margin, as well as by the narrow, uniformly broad distal margin of the hindwing.

In the following forms the band-like streak through the cell of the forewing is absent.

L. borilis spec. nov. I thus name a similar species to *didymaea*, from Pozuzo in South Peru, with the *borilis*. wings dusted with white, without the streak in the cell. The distal margin of the hindwing is much broader.

L. synnova Hew. (38 f). This rare and beautiful species is very strikingly distinguished by the orange synnova. colouring (in the figure this is too dark) from the otherwise similarly marked species, such as ramona, etc. According to BATES it only flies on the north bank of the Upper Amazon, near Tunantins.

L. quintina Fldr. (38 f) is said to come from Venezuela, I know it only from Bolivia and Peru. It quintina. has white-dusted wings with black margins and an oblique band at the end of the cell of the forewing, which is gradually narrowed posteriorly. — The very similar **alexina** Hew., from Peru and Bolivia, has colourless alexina. wings, only the subapical band of the forewing is dusted with white. The markings strongly recall Ithomia ardea, which, however, is distinguished by the neuration.

Next follows another small group with broad, rounded wings and black streak through the cell of the forewing, of which L. astraea Cr. (39 b) is often mistaken for some other species. The typical form comes astraea. from Guiana. It has a broad, black oblique band on the forewing, which is only forked shortly before the distal margin; also quite faint red-brown colour in the distal margin of the hindwing. — thimei Oberth. (= flora thimei. Hew. Exot. But. f. 68), from the Rio Magdalena in Colombia, is very similarly marked, but has no red-brown on the upper surface and beneath only at the base. Moreover, the distal margin of the hindwing is narrower and uniformly broad. — flora Cr., from Cayenne and Surinam, is a larger form with broad margins and b nds flora. and also red-brown markings in the distal margin of the hindwing. At the distal margin of the forewing 2 distinct white spots are marked off by the branches of the oblique band. — On the Lower Amazon flies a smaller form of astraea, with roundish apex to the forewing, which I call antaxis form. nov. It has a light antaxis. red-brown, dark-bordered distal margin to the hindwing and a similar spot at the hinder angle of the forewing.

An extremely similar species from the Middle Amazon, which I call. L. stradopsis spec. nov., has dif-stradopsis. ferent neuration and more pointed apex to the forewing. The upper arm of the lower discocellular and also the middle discocellular are longer. The oblique band of the forewing is rather gradually narrowed beyond the 2^{rd} median, the 3^{rd} is not thickened,

In L. egra Hew. (39 b) the black oblique band of the forewing is very broad, runs on the 3^{rd} median *egra*. vein and is connected at the other side with the black inner margin. The species flies on the Amazons.

LEUCOTHYRIS. By R. Haensch.

L. aguata Weym. (39 b), from Brazil, is similar to astraea, with narrower margins and bands. The oblique band at the end of the cell only extends a little beyond the inner angle. The black streak across the middle of the cell is said to be of uniform width in typical specimens. Many examples, however, occur in which it is wedge-shaped.

In another species, which I call L. serdolis spec. nov., a wedge-shaped oblique band runs from the scrdotis. end of the cell across the 3rd median vein, and the vitreous spots are dusted with white. The pattern otherwise the same as in *astrea*. This form flies on the Upper Amazon.

Here begins the 2rd principal group of *Leucothyris* with elongate, colourless wings, which bear delicate whitish spots. Of these one at the distal margin of the forewing between the 2rd and 3rd median veins is especially characteristic of the group, as it is placed so close to the distal border that the dark distal margin is always narrowed here. There are two similar whitish spots at the apex of the forewing. The neuration of the hindwing is also very varied in this group. There occur both species with typical Hyposcada-neuration and also very many in which the cell is considerably longer than in typical Leucothyris-species.

- L. susiana Fldr. (38 g). This beautiful and rare species from the eastern Andes of Colombia and Ecuador _ susiana. has black wings with several rows of white vitreous spots. On the under surface the predominant colour is red-brown. The forewing has at the base an oblong spot, then follow 2 rows of white spots before and behind the end of the cell, and also 3 subapical spots and some white marginal dots. The hindwing shows in the susanna. disc a continuous white macular oblique band and large white double marginal dots. --- susanna Stgr. is a very similar form from Colombia with smaller white spots and dots, but a broader yellowish oblique band on the hindwing.
 - L. cyrene Latr. is similar to susiana, from the Upper Amazon and Peru. The position of the vitreous cyrene. spots is somewhat different. The middle spot of the first row is absent and the band of the hindwing is widened rading, at the inner margin. — A nearly allied form from Colombia, which I call rading form. nov., has a double spot in the end of the cell of the forewing and behind it 3 vitreous spots. The oblique band of the hindwing is widened at the inner margin to the base. — Napeogenes domiduca Hew., from Bolivia, very closely resembles the Leucothyris-forms now under consideration, but belongs to the genus Napeogenes, as I have only recently been able to prove from typical specimens. It has a large basal vitreous area in the forewing and from the end of the cell to the hinder angle a broad macular band, divided at the costal margin. Cf. Additions, p. 165.
 - L. attalia Hew. (38 g) has a black spot in the end of the cell of the forewing and numerous vitreous attatia. attatita. spots in the apical half. The species flies in Bolivia and Peru. - attalita Hsch. is a much smaller form from Bolivia. The vitreous spots have a strong milky colouring and on the under surface the yellow-brown colour of attalia is here grey-brown.
 - L. taliata Hew., from Peru, has larger, contiguous vitreous spots in the disc of the forewing and a tatiata. very broad vitreous band on the hindwing, as well as larger marginal dots on both wings.
- L. solida Weym. (38 g). Here the vitreous spot between the 2^{nd} and 3^{rd} median veins in the discalmacular sotida. band of the forewing is the longest (in *taliata* it is the one between the 1st and 2nd veins). The large marginal dots are almost entirely absent. On the hindwing the vitreous band is narrower in the middle. - In ab. completa. completa Hsch., which flies with the type in eastern Ecuador, the costal margin of the hindwing is black to beyond the cell, so that the vitreous band is narrower.
- L. orestilla Hew. (38 g) is the largest species of the true Ithomiids. The markings are similar to those orestilla. of solida, with much larger vitreous spots. The third apical spot at the costal margin is absent. It flies in the eastern Andes of Colombia and Ecuador in thick mountain woods near the tree-limit at elevations of up to 3000 m.
- L. valida Hsch., from the borders of Peru and Bolivia, is the same size as susiana and resembles comvatida. pleta, without the white marginal spots on the upper surface. The small white dot between the end of the cell and the apex is in alignment with the two other subapical spots, and the vitreous spots at the hinder angle are larger.
- tasciata. L. fasciata Hsch., from the Upper Pastaza in Ecuador, is smaller, with narrow black costal margin to the hindwing and spot across the end of the cell. It has a milky oblique band in the vitreous area of the hindwing, whilst in solida, which is otherwise similar, the whole disc is milky coloured.

L. deronda Hew. (39 a), from Peru and Bolivia, is distinguishable from the similar forms by the yelderonda. lowish tinted forewing. In markings it is similar to the preceding forms, but the apex is much more narrowly black, so that the two apical vitreous spots are not defined proximally. - derondina (Stgr. i. l.) is a much dcrondina.

smaller but otherwise extremely similar form from Bolivia with somewhat different neuration. The second yellow spot at the costal margin of the forewing above is absent. The spot in the cell is narrower and in the φ the black spot is absent in the angle which the median forms with its 1. branch.

L. cytharista Hew., from Peru, probably also belongs here. It is of the same size as deronda and has cutharista. yellowish forewing with dentate distal margin and curved half-band across the end of the cell. The hindwing has a bluish white tone and broad distal margin, strongly dentate proximally, with large white dots.

148

aquata.

LEUCOTHYRIS. By R. Haensch.

149

Under the name L. athalina (38 g) STAUDINGER united several similar forms. I regard as typical speci- athalina. mens according to STAUDINGER's figure those from Bolivia of which the \mathcal{Q} bears a dark mark across the cell of the hindwing. The forewing is similar to that of *valida*, but the second white dot at the costal margin near the apex is absent. — The similar form from Colombia I call **tremona** form. nov. In the \mathcal{Q} the dark mark tremona. on the median of the hindwing is absent and also the connecting triangle between the end of the cell and the inner margin. The half-band at the end of the cell is produced into a point at the 3rd median vein. — **ban***banjana*. **jana** Hsch. is the form from eastern Ecuador, which occurs at elevations of from 2—3000 m. The two apical vitreous spots are proximally bordered with black. The half-band at the end of the cell is as in *athalina*, but in the \mathcal{Q} the dark mark on the median of the hindwing is absent. On the under surface the colour is brownred. lightest in *tremona*: yellow-brown. — **santineza** Hsch. is a smaller form from Ecuador; it flies at elevations *santineza*. of from 1000—15000 m. The spot in the cell of the forewing in the \mathcal{J} is wedge-shaped, in the \mathcal{Q} broader, with the extremity obtuse.

L. tabera *Hew*. (39 a), from the eastern Andes of Ecuador, has narrower half-bands across the end of *tabera*. the cell of the forewing and in the middle of the cell. The distal margin of the hindwing is very broadly edged with black. On the under surface the margins have dark brown-red markings. — In ab. macrenda *Hsch*. the *macrenda*. apex of the forewing is broadly black with two vitreous spots. The hindwing has the distal half and the apex black.

The following forms have a narrower distal margin to the hindwing.

L. makrena Hew. (39 a), from Venezuela and Colombia, differs from the similar forms, such as santi- makrena. neza, etc., in the much narrower distal margin of the hindwing. The half-band at the end of the cell of the forewing is broad, the streak in the middle of the cell narrow. — makrenita Hsch. (39 a) is considerably smaller, makrenita. it flies in eastern Ecuador. The markings are similar to those of makrena, behind the end of the cell of the forewing there is a white macular band.

L. baizana *Hsch.*, likewise from the eastern Andes of Ecuador, may be recognised at once by the smoky *baizana*. brown colour and the long, narrow wings. The markings are similar to those of *makrena*. The dark brown distal border of the hindwing is proximally dentate at the veins.

L. quadrata *Hsch.* (39 a), from eastern Ecuador, is smaller than the preceding and may be recognised *quadrata*. by the broad wings and the 2 vitreous spots in the apex of the forewing. The wings have a bluish white sheen.

L. amalda *Hew*. (39 b), from Colombia, has very similar markings, but differs notably in the red-brown *amalda*. colour in the distal half of the hindwing. It flies together with the very similar *Pseudoscada lavinia*, but is easy to recognise by the dark streak in the cell of the forewing. — **amaldina** (*Stgr. i. l.*) is a smaller, more weakly *amaldina*. marked form, likewise from Colombia. Its hindwing is diaphanous except for a yellow-brown distal margin.

L. modesta *Hsch.*, from western Ecuador and Colombia, has similar markings to *quadrata*. The apex *modesta*. of the forewing is rounded; the half-band at the end of the cell is short, triangular; the dark distal border of the hindwing narrow.

L. bioculata *Hsch.*, from Bolivia, is likewise a similar form to *makrenita*; with 2 vitreous spots in the *bioculata*. apex of the forewing and indistinct streak in the cell. Beneath the margins are yellow-brown, with only 2 white dots in the apex of each wing.

L. epimakrena *Hsch.*, from Bolivia, is about the same size as *makrena* and has similar markings. It *epimakrena*. may be recognised by having the distal border of the hindwing proximally dentate at the veins and a dark streak at the end of the cell. The wings are elongate; the spot in the middle of the cell of the forewing wedgeshaped.

L. zea Hew. (39 b) is one of the few but peculiar Ithomiids which occur in Mexico. Prominent zea. characters are the brown-red margins and the presence of only one vitreous spot in the apex of the forewing. — vicina Salv. is a similar form, also with brown-red margins, from Costa Rica. It is smaller, the margins vicina. in the apex of the forewing are narrower. The spot at the end of the cell is triangular; the streak in the middle of the cell narrower.

L. caucana Stgr. (39 b), from the Cauca Valley in Colombia, has narrower margins and patches than caucana. makrena. The black streak in the middle of the cell is often entirely absent.

L. phemonoë Dbl. & Hew. (= morphenoë H.-Schäff.) (39 b), from Colombia and Venezuela, has rounded phemonoë. wings with narrow margins and a narrow streak in the cell of the forewing. The subcostal of the forewing is red-brown; the whitish patches at the apex and distal margin are indistinct. — burchelli Sand., from the burchelli. Rio Tocantins, is said to be nearly allied to the preceding form, but to be distinguished by broader margins and patches. Especially the dark oblique band across the end of the cell is prolonged and then continued as a distinct stripe on the 2nd median vein to the distal margin.

EPISCADA. By R. Haensch.

L. rubescens Bilr. & Druce (39 c), from Costa Rica, has the margins partly red-brown, as in vicina, rubescens. but a broad black-brown apex to the forewing, and also a broad white oblique band.

The following forms have no dark streak in the cell of the forewing.

- L. inelegans Hew., from Ecuador, is of the same size as susiana and has vitreous wings with dark distal margins, strongly dentate proximally, especially in the hindwing. Across the end of the cell of the forewing is placed a half-band, with process at the 3rd median vein. On the under surface the margins are red-brown with white distal-marginal double spots.
- L. fumata Hsch., from the Cauca Valley, is of the same size as makrenita and has narrow borders to fumala. the slightly smoke-brown wings and narrow half-band at the end of the cell of the forewing. Beneath the margins are light vellow-brown.
- L. manora Schaus, from Central Brazil, is said to have transparent bluish white wings with blackish manora. margins and veins. In the apex of the forewing a vitreous spot, at the end of the cell a whitish patch.
- As L. sarilis spec. nov. I designate a form from the Upper Amazon, similar to graciella, with 2 vitreous sarilis. spots in the black apex of the forewing. The half-band at the end of the cell has a projection above the 3rd median vein; the whole of the 2rd vein is broadly black.
- L. graciella Oberth. (= victorina Hew.) (39 c), from the Upper Amazon, and victorina Guér., from Venezuela and Colombia, are very much alike. They have a broad black apex and a broad white oblique band at the end of the cell. In graciella the veins in the white oblique band are completely covered, whilst in victorina padilla. the upper vein and half the second one appear black. - padilla Hew., from western Ecuador, is also very similar, with broader white oblique band, which reaches to the hinder angle, so that the 2rd median vein also paula. is dusted with white. — paula Weym., from Central America, is likewise similar, with narrow white oblique
 - band, broad, almost quadrangular, black spot at the end of the cell and red-brown costal margin, and also a red-brown spot at the hinder angle of the forewing and distal margin of the hindwing.
- L. estella Hew. (39 c), from eastern Ecuador, is a small species with broad black apex to the forewing and distal margin to the hindwing, the latter with a red-brown stripe, and also with a broad white oblique band in the forewing. On the under surface the dark margins have yellow-brown central stripes. -- In Bolivia subosa. occurs a similar form, which I call subosa form. nov. It has a narrower white oblique band and norrower distal margin to the hindwing. Moreover, the whole disc of the latter is whitish, together with the veins; in estella only at the apex, the rest being colourless with black veins.

Finally I refer here 2 new forms, which are very different from the preceding, but according to the neuration agree best with Leucothyris.

L. ferra spec. nov. (39 d) strongly recalls by its markings species of Thuridia, Aprotopos and Dircenna. ferra. The wings are almost colourless with dark brown margins and a transverse band across the end of the cell of each wing. In the middle of the distal margin of the hindwing there are 3 white dots. The antenna has vellowish club. On the under surface all the distal margins have white marginal dots as far as the apex. thuridiana, From southern Peru. - thyridiana form. nov. is a similar, larger form from Bolivia with black margins and bands and a triangular spot in the cell of the forewing. Otherwise the markings are as in the preceding. On the under surface a yellowish streak is placed behind the base of the hindwing.

26. Genus: Episcada Godm. & Salv.

This also is only a genus of convenience, whose characters are not sharply defined. Properly the upper discocellular of the hindwing should be entirely absent in the \mathcal{J} , but mostly it is still feebly present. The habitus of the species referred to Episcada is always very different from that of Leucothyris and approaches much more that of the following genus *Pteronumia*. The lower discocellular in *Episcada* appears to be always very distinctly angled, whilst in Leucothyris the anterior arm disappears in the dark costal-marginal stripe. The cell of the hindwing in typical species is almost equally long anteriorly and posteriorly.

The species of *Episcada* are mostly not easy to recognise as such, since superficially they closely resemble certain species of *Pteronymia*. Only the $\frac{1}{2}$ are more certainly distinguishable by the upper discocelhular and radial of the hindwing. The few species of Episcada are scattered over the whole Neotropical region and are generally not very common.

E. salvinia Bates (39 d), from Guatemala, has delicate, almost colourless wings with narrow brown salvinia. margins and half-band at the end of the cell of the forewing, and also a white spot at the costal margin. On the underside the margins are lighter yellow-brown. - rufocincta Salv., from Mexico, is a similar form with ruíocincla. yellow-brown margins, blackish streak at the inner margin of the forewing, and without white patch at the end of the cell.

E. clausina Hew. (39 d), from Bolivia, has dark brown margins and half-band with yellow spot at clausing the end of the cell. The costal margin of the hindwing is yellow beneath. The subcostal of the forewing is striposis. red-brown; in the Q also the inner margin. - In Central Brazil occurs a very similar form, which I call striposis

inelegans.

graciclla. victorina.

eslella.

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EPISCADA By R. Haensch.

form. nov. It has additional yellow dusting in the end of the cell of the forewing and on the hindwing. On the under surface the margins are darker red-brown with blackish borders.

E. carcinia Schaus, from South Brazil, is said to have colourless wings with narrow margins and a carcinia. white spot behind the cell at the costal margin of the forewing. — In **pasena**. Schaus, from Central Brazil, the *pasena*. body is said to be grey beneath; the transparent wings with very narrow brown margins. Forewing with narrow streak at the end of the cell and a transparent streak at the costal margin. Hindwing with 1—2 white dots at the apex of the under surface.

E. mira *Hew.* (= segesta *Weym.*) (39 d), from eastern Ecuador, has a very broad yellow half-band at *mira*. the end of the cell of the forewing and is otherwise similar to *clausina*.

E. hymenaea *Prittw.* (39 e), from Central Brazil, has brownish margins and half-band at the end of the *hymenaea*. cell of the forewing and in addition a whitish patch. Diaphanous spots are placed at the distal margin of both wings. On the under surface the margins are lighter. — hymen *Hsch.* (39 e), from southern Bolivia, *hymen.* is smaller with broader margins and half-band at the end of the cell, and also a yellow oblique band. Subcostal red-brown at the base. The median, the end of the cell and the hinder angle of the forewing are dusted with yellow, and also the lower radial of the hindwing and a stripe at the costal margin on the under surface.

E. sulphurea *Hsch.*, from the border of Peru and Bolivia, has longer wings, broader yellow oblique *sulphurea*. band and broader dark brown margins. The yellow dusting is extended over the cell of the forewing and the greater part of the hindwing; on the other hand it is absent at the costal margin of the hindwing beneath.

E. sao *Hbn.* (39 d), from Brazil, has broader dark margins and yellow patch at the end of the cell of sao. the forewing. Base of the under surface of the hindwing yellow-brown, distal margin with 4 white crescents. — **obscurata** *F*. is according to BUTLER a dark form of the preceding.

obscurata.

E. sylpha *Hsch.* (39 e), from Venezuela, is similar to *Miraleria sylvella*, but is smaller and has different *sylpha*. neuration. The wings are diaphanous with brownish margins; at the costal and inner margins of the forewing with yellow-brown, and the same at the inner angle of the hindwing. At the end of the cell of the forewing a yellow patch.

E. polita Weym. (39 e) is very similar to Pteronymia aletta. The wings are dark-shaded with dark polita. brown margins. The inner margin and the subcostal of the forewing, as well as the veins in the disc of the hindwing, are yellow-brown. Besides the yellow spot at the end of the cell both wings have further yellowish patches at the distal margin and in the end of the cell. polita flies together with Pteronymia aletta in Colombia.

E. cabenis Hsch. is somewhat larger, with colourless wings, dark brown margins and white half-band *cabenis*. behind the brown one at the end of the cell. On the under surface the margins are yellow-brown, dark-margined with 1-2 dots in the apex of both wings. It flies like the similar **helena** Hsch. in eastern Colombia. The *helena*. latter is still larger, with narrower margins, triangular spot at the end of the cell of the forewing and broader white half-band.

E. sidonia *Hsch.*, from southern Peru, has more pointed wings; cell of the hindwing with long recurrent *sidonia*. vein. The white patch at the end of the cell of the forewing is only distinct at the costal margin and on the radials. On the under surface the margins are deep ochreous coloured, without white dots in the apex.

E. cora (Bang-H. i. l.), from Bolivia, is larger than the similar **ticidella** Hew. (39 e), from eastern Ecuador. *ticidella* The wings in *cora* are slightly brownish; behind the end of the cell of the forewing, at the distal margin and at the inner angle of the hindwing yellowish. Across the end of the cell of the forewing there is a broad brown wedge-spot; in *ticidella* there is only a very narrow dark mark here and behind it a whitish patch. On the under surface the margins in *cora* are light yellow-brown, in *ticidella* brownish with white dots in the apex of the forewing and at the distal margin of the hindwing.

E. canilla Hew. (= canaletta Stgr.) (39 c) has elongate wings with yellow dusting, except in the apex. canilla. The margins are dark brown; in the φ , especially in the hindwing, much broader. On the under surface the margins are brown-red, with dark borders; at the base of the hindwing yellow; with white double spots in the apex of the forewing and at the distal margin of the hindwing.

E. perasippa *Hew.* (39 e) is a very large, little marked species from Ecuador and Colombia. The wings *perasippa*. are yellowish, vitreous with narrow brown margins and a streak across the end of the cell of the forewing. The subcostal of the forewing and the underside of the margins are yellow-brown.

E. dirama Hsch. (39 f), from Bolivia, is smaller, with broader streak at the end of the cell and yellow dirama. spot behind it. The costal margin of the hindwing is yellow on the under surface. — alidella Hew., from Co- alidella. lombia, is a very similar form, which also much resembles Pteronymia alida. HEWITSON has noticed that there is a difference between the two in the neuration, which also appears to be constant for other species of Episcada and Pteronymia: in alida the lower arm of the lower discocellular of the forewing is the longer; in alidella it is the upper one. alidella has broader wings with dark margins and broad yellow half-band at the end of the cell of the forewing. In the Q there are further several yellow patches at the distal margin.

E. scantilla *Hew.*, from eastern Ecuador and Colombia, has similar wing-form to *dirama*, a white spot *scantilla*. at the end of the cell of the forewing and white patches at the distal margins.

PTERONYMIA. By R. Haensch.

- E. paradoxa Stgr., from the Cauca Valley, is a large species with colourless wings and narrow borders. paradoxa. only the costal and inner margins of the forewing have broad margins, the end of the cell is without marking, Similar species are Napeogenes flossina (35 g) and Hymenitis quinta.
- E. praestigiosa Hsch. closely resembles Dismenitis cleonica (41 e), but is distinguishable at once by the praestigiosa. acutely angled lower discocellular of the hindwing. The forewing is slightly shaded, the hindwing tinged with vellowish; with white patches at the end of the cell of the forewing and the distal margins. The end of the cell of the forewing is in the 3 very narrowly, in the 9 broadly coloured with brown. The distal margins are proximally produced into points at the veins. - A similar, smaller species from Colombia, which I call lobusa. lobusa spec. nov., has a yellowish patch at the end of the cell, more weakly dentate distal margins, narrower marks at the end of the cell and at the distal margin of the hindwing; on the under surface large white double spots, which are entirely absent in praestigiosa.
- philoclea. The following E. philoclea Hew. (39 d), from southern Brazil, has already quite the appearance of a Pteronymia, but still a distinct upper discocellular and radial in the hindwing of the 33. It has yellowish wings with black margins, half-band across the end of the cell and yellowish patch beside it. In the disc of the hindwing the veins are also yellowish. On the under surface the margins are dark brown-red, with white double spots at the distal margin of the hindwing and the apex of the forewing. The costal margin of the hindwing is yellowish with reddish spot at the base. The species recalls *Ceratinia eupompe* (35 d), with which it occurs manda, together. — munda Weym, is a form with broader margins and connecting streak between the half-band and the inner margin of the forewing.

27. Genus: Pteronymia Btlr. & Druce.

To this genus should rightly belong only species in which the upper discocellular of the hindwing is absent and in the dd of which at least the greater part of the upper radial is coincident with the subcostal. But when one has only female specimens it is often difficult to determine whether the species belongs to Pteronymia or Episcada, for superficially forms of the two genera are often very similar. There are no distinctive external characters for the whole genus, as in Leucothyris. The commonest pattern is that shown in zerlina (39g); yet there are also gay-coloured species, such as *latilla*, which recall *Episcada*. The forms belonging to *Ptero-nymia* are rather numerous. They often occur in numbers, are mostly widely distributed and therefore not rare. A few even occur in great profusion, such as zerlina. simplex, artena, euritea. The Andes from Bolivia to Colombia produce the largest number of species.

- latilla. P. latilla Hew. (39 f), from Venezuela and Colombia, has transparent yellowish wings with yellowbrown dusting, especially at the base of the forewing and the inner angle of the hindwing. The apical half of the forewing is blackish with 2 yellow macular bands. The margins of both wings and a spot in the cell albicans. of the forewing are also blackish. — In ab. albicans Hsch. the yellow macular bands are whitish and the end nigricans. of the cell of the forewing and the apical third of the hindwing are dusted with yellow. - In ab. nigricans Hsch. the spot in the cell, the costal and inner margin, and also the end of the cell of the forewing and a band on the median are broadly black-brown. It flies in Colombia.
 - P. barilla Hsch. is a form similar to latilla; from western Ecuador. It has more delicate colouring, barilla. smaller vellow dots, a red-brown base to the inner margin of the forewing, slightly reddish colour on the hindwing and much smaller white marginal dots in the distal margin of the hindwing beneath.
 - P. picta Salv., from Colombia, has a blackish forewing, the base of the cell is brown, the middle yellow, picta. across the end is placed a black spot. In the distal half there are 2 vellow macular bands consisting of 4 or 5 spots. The hindwing is yellow, with broad black distal margin and brown streak at the inner angle.
 - notilla. **P. notilla** Btlr. & Druce (39 f \mathcal{J} , \mathcal{Q}). The \mathcal{J} has a similar pattern to latilla, but paler, also the dark spot in the cell is absent. In the φ the colouring is much lighter; the cell shaded with dark and the hindwing unicolorous. red-brown. This is the Central American form of the group, from Costa Rica. It has black olyrilla. antenna, while that of the preceding forms has a yellowish club. - olyrilla Btlr. & Druce, likewise from Costa Rica, recalls the similar Dircenna olyras by the vitreous longitudinal band in the hindwing, and differs principally in this from the preceding form.
 - donella. P. donella Fldr., from Colombia, has a red-brown basal third to the forewing and a differently shaped half-band at the end of the cell. The hindwing as in the Q of notilla is uniformly red-brown with broader dark distal margin.
 - P. donata (Bang-H. i. l.) is a smaller form from Panama and Costa Rica with lighter colour and very donata. broad, angled yellow band to the forewing, which extends from the costal margin across the end of the cell to the inner margin. Otherwise the markings are similar to those of donella.
- P. fulvimargo Bilr. & Druce, from Costa Rica, is said to be similar to Episcada obscurata and Dircenna fulvimargo. olyras (36 e). The forewing is transparent with faint yellowish macular band at the end of the cell and the distal
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PTERONYMIA. By R. Haensch.

margin. and also with blackish half-band at the end of the cell. The hindwing has dark margins and also a red-brown sub marginal band and red-brown veins. σ and φ are coloured almost alike.

P. fulvescens Godm. & Salv., from Costa Rica, is said to be similar to *latilla* and *fulvimargo*. The *fulvescens*. upper radial of the hindwing is entirely absent. The club of the antenna is yellow.

P. splendida *Hsch.*, from eastern Colombia, of which only the φ is known to me, has the fore-*splendida*. wing similar to that of *notilla*- φ , with broader black margins and dark spot in the middle of the cell. The hindwing is slightly yellow-brown, with a yellow spot at the apex and very broad black distal margin. The club of the antenna is yellow-brown.

P. dispar *Hsch.* (39 f) has transparent yellowish wings with black margins and half-band at the end *dispar.* of the cell, which beneath are variegated with brownish. Club of the antenna yellow-brown. In the φ the subcostal and median of the forewing, as well as the veins in the disc of the hindwing, are yellow-brown. The species flies in Colombia and Venezuela.

P. alinda *Fldr.*, from Venezuela, is said strongly to recall *donella* in the markings. Forewing in the *alinda*. cell yellow-brown, subcostal and median red-brown, the other margins black-brown. In the blackish apical area 2 yellowish macular bands. Hindwing dusted with yellow-brown, with red-brown veins and blackish distal margin.

P. veia *Hew.* (39 g), from Venezuela and Colombia, has a broad yellow oblique band at the end of *veia*. the cell of the forewing and yellow-brown margins on the under surface with large white crescents. In the Q the margins are broader and a dark spot is placed at the end of the median of the forewing. — In ab. **brunnea** (*Stgr. i. l.*) the subcostal and median of the forewing and also the veins in the disc of the *brunnea*. hindwing are yellow-brown. The yellow oblique band is still broader and more brightly coloured.

P. zerlina Hew. (= arinia H.-Schäff.) (39 g) has vitreous wings with blue-grey sheen and dark zerlina. brown margins; only the costal margin of the forewing is red-brown. At the dark band at the end of the cell and at the distal margin of the forewing there are whitish patches. In the red-brown margins of the under surface are placed at the apex of the forewing single, and at the distal margin of the hindwing double white dots. In the \mathcal{Q} the immer margin and the half-band of the forewing are connected by a dark triangle. — In a local form from southern Peru, which I call **tamina** form. nov., the club of the tamina. antenna is yellow-brown. The basal half of the cell is shaded with dark; the apical half of the forewing is yellowish and the disc of the hindwing has bluish white sheen. On the under surface the white dots are much smaller. — **hara** Hew. is a local form of zerlina, from Ecuador, with whitish patches behind the hara. end of the cell and at the distal margin of the forewing. The subcostal is red-brown.

P. lincera *H.-Schäff.* (39 g) has transparent yellow-brown wings, with yellowish patches at the end *lincera*. of the cell and at the distal margin of the forewing. Subcostal and median are light red-brown. Otherwise the markings are similar to those of *zerlina*. Eastern Ecuador and Colombia. — **alina** (*Stgr. i. l.*) is *aluna*. a form similar to *zerlina*, from Bolivia, with red-brown, dark-edged margins on the upper surface, light yellow-brown beneath; with yellowish patches in the end of the cell, behind the cell, at the distal marginof the forewing and at the apex of the hindwing. In the Q the margins are proportionately broader.

P. pronuba Hew., from western Ecuador, has colourless wings with black margins and black-white pronuba. half-band at the discocellular. Subcostal and median are red-brown at the base. In the φ both the margins and the white half-band are much broader.

In **P. tucuna** Bates (39 g), from the Upper Amazon, the dark-margined wings are provided with *tucuna*. numerous yellow dots, namely in and behind the end of the cell, at the distal margin and hinder angle of the forewing, and also in the disc of the hindwing. The black antennae have yellow-brown clubs. **tanampaya** (Stgr. i. l.). from Bolivia, has narrower wings. The whole cell of the forewing and the *tanampaya*. disc of the hindwing are dusted with yellow. The margins beneath are dark red-brown, in *tucuna* yellowbrown. — **bueya** (Bang-H. i. l.) is very similar to the preceding, but with red-brown subcostal and red- *bueya*. brown margins on the underside. It likewise flies in Bolivia.

P. zabina *Hew.* (40 b), from Colombia and Ecuador, has broader wings with smaller yellowish dots *zabina*. at the end of the cell and the distal margin of both wings. Antenna black; subcostal and a narrow inner-marginal stripe are red-brown. — In ab. **brunneata** *Hsch.* the median and the veins in the disc of *brunneata*. both wings are also red-brown. At the end of the cell of the forewing there is a yellow half-band.

P. huamba spec. nov. I call a small form similar to *lincera*, also from the eastern Andes of Ecuahuamba. dor, with slightly yellowish wings and faint yellow-brown patches at the end of the cell and distal margin of the forewing. The margins are black-grey, only the subcostal of the forewing slightly yellowbrown. The white double spots at the distal margin of the hindwing are very large. — **oneida** *Hev.* oneida. (39 g), from Colombia and Ecuador, is somewhat larger, with more brightly coloured wings. The distal margin of the hindwing is proximally dentate, especially in the \mathcal{Q} . There is a dark, isolated spot in the disc of the forewing at the end of the cell. The subcostal is broadly yellow-brown.

154

PTERONYMIA. By R. Haensch.

- P. inania Hsch. is a similar, larger species with broader wings and deep black-brown margins. Beinania. hind the end of the cell is placed at the costal margin an oblong yellow-brown spot. On the under sur-face there are numerous roundish white dots in the distal margin. This species, like the preceding, comes from the border of eastern Ecuador and Colombia.
- P. serrata Hsch. has still larger and broader, slightly yellowish wings with strongly dentate distal serrata. border. The half-band at the end of the cell of the forewing is proximally widened. On the under surface there are quadrate, yellow-brown, dark-margined spots at the distal margin of the hindwing between the white double spots. This species flies with Dismenitis theudelinda (41 d) and other similar forms in the mountain forests of the eastern chain of the Cordilleras of Ecuador at elevations of from 2-3000 m.
- P. teresita Hew. (40 a, b), from eastern Ecuador, has broad wings, almost colourless in the 3, with teresita. narrow dark margins. In the Q the wings are dusted with yellowish, especially the hindwing. The latter has much broader distal border than in the 3. On the under surface the margins are dark red-brown, with white dots in the apex of the forewing and at the distal margin of the hindwing.
- In **P. evonia** *Hsch.*, from Colombia, with shorter wings, the φ is of a yellow-brown colour, especievonia. ally in the cell and at the end of the median of the forewing, and also at the proximal border of the costal and distal margins and on the veins in the disc of the hindwing. The antenna is black. The distal margin of the hindwing very broadly black.
- P. sulmona Hew., from Ecuador, is said to be similar to teresita, with narrower margins and black sulmona. antenna. The base of the forewing and the hindwing are dusted with red-brown. On the under surface , there is a white spot in the apex of each wing and the base of the hindwing is yellow.
 - P. suesa Hew., from Ecuador, has transparent wings with yellowish sheen and narrow brown marsuesa. gins and half-band across the end of the cell of the forewing. The club of the antenna is yellow-brown. On the under surface the margins are vellow-brown, with 2 white dots in the apex of the forewing and a row of double dots at the distal margin of the hindwing.
- P. thabena Hew. (40 a), from the eastern ridge of the Andes in Ecuador, has broad, transparent thabena. wings, the forewing with yellowish, the hindwing with bluish sheen. Unfortunately only QQ are known of this and the following similar forms, so that the genus cannot be exactly fixed. The marking recalls forms of zerlina. The distal margin of the hindwing especially is very broad, and on the underside, where it is red-brown, provided with whitish double dots. The antenna has yellow-brown club. — A local form stantis, from Bolivia, which I call stantis form. nov., is distinguished by a narrow black half-band at the end of aegineta, the cell of the hindwing. - From Ecuador comes another similar form, aegineta Hew. It has the distal margin of the hindwing strongly dentate proximally and a proximally widened half-band at the end of the cleobulina. cell of the forewing. - cleobulina Hew., from Bolivia, probably also belongs here. It has the hindwing like thabena, but in the cell of the forewing in addition a black bar, and at the black distal margin a projection in the direction of the somewhat prolonged half-band at the end of the cell.
- P. denticulata Hsch. (40 b), from Bolivia, has black margins and half-band at the end of the cell of denticulata. the forewing; the distal margins are proximally dentate. The club of the antenna is yellow-brown. - In dispacea. dispacea Hew. (40 a), from the same district, the margins are brown; subcostal of the forewing reddish; antenna black. In the Q the margins are broader and partly red-brown.
 - P. alida Hew. (40 a), from Venezuela, has narrower margins and a broad yellow half-band behind alida. the uniformly broad half-band at the end of the cell. It closely resembles Episcada alidella.
 - P. calgiria Schaus (? = dircennoides Star. i. l.), from Bolivia, is said to have transparent yellowish calgiria. wings, with narrow dark brown margins and veins, and also curved half-band at the end of the cell of the forewing; behind this there are yellowish spots at the costal and distal margins; also at the base and in the end of the cell of the forewing. The distal margin of the hindwing is broadest at the 2^{nd} median vein and in the apex. Club of the antenna yellow-brown.
- P. tigranes Godm. & Salv. (40 b), from Central America, has colourless wings with narrow dark tiaranes. margins, somewhat broader in the Q; in the forewing red-brown subcostal, and also a broad dark and timagenes, white half-band at the end of the cell. — timagenes Godm. & Salv., from Mexico, at elevations of up to
- about 2000 m., differs from the preceding by the red-brown margins, only the inner margin of the forealcmena, wing is blackish. The half-band at the end of the cell is much smaller. - alcmena Godm. & Salv., from Guatemala, is somewhat smaller, with broader, reddish margins. The dark and the white half-band at the end of the cell are larger and more obliquely placed.
 - P. adina Hew., from Venezuela, is a similar species to tigranes, without red-brown subcostal and adina. with oblong white spot at the costal margin of the forewing. The costal margin of the hindwing is strongly arched, the middle discocellular very long and curved.
 - P. eulyra Fldr., from Venezuela, is said to be similar to Episcada alidella, but much smaller, with eulyra. white submarginal spots on the under surface.

PTERONYMIA. By R. Hacnsch.

P. apuleia Hew. (? φ = santanella Hsch.) (40 a), from eastern Ecuador, is very similar to Mira-aputeia. leria sylvella (40 e), but may be known by the strongly angled lower discocellular of the hindwing. The margins, except the yellow-brown costal margin of the forewing, are narrowly dark brown; the half-band at the end of the cell of the forewing is somewhat curved and pointed.

P. granica Hew. is a similar species, also from Ecuador; but the half-band at the end of the cell is granica. absent. On the under surface the base of the costal margin of the hindwing is yellow and each wing has 2 whitish dots in the apex.

P. ticida Hew. (40 e), from eastern Ecuador, has narrow wings with black margins; at the base of lieida. both wings vellowish dusting. It closely resembles Episcada licidella (39 e). But on the under surface the margins are black, only the base of the hindwing is yellow. In the apex of the forewing are placed 3, at the distal margin of the hindwing 5 oblong white dots. - yungava Hsch. is a similar form from Bolivia. yungava, The margins are brownish; subcostal of the forewing red-brown, on the underside yellow-brown with only one white dot in the apex of the hindwing.

P. starkei Stgr., from Venezuela, has broader wings and in addition to the usual dark markings and starkei. the half-band at the end of the cell an indistinct bar in the cell of the forewing. In other respects this form approaches adina. - A form from western Ecuador, similar to zabina and starkei, which I call semonis form. nov., has broad vitreous wings with narrow dark margins and red-brown subcostal, as semonis. well as dark half-band and whitish spot at the costal margin of the forewing. On the under surface very minute whitish dots are placed in the dark distal border of the yellow-brown margins.

P. ladra Stgr., from Ecuador, has similar wing-contour to ticida. The margins are brown above, ladra. vellow-brown beneath except the vellowish costal margin of the hindwing. The end of the cell of the forewing has no markings.

P. minna Schaus, from Bolivia, is said to have transparent wings of 55 mm. expanse; with narrow minna. dark margins and a vellow streak at the costal margin of the forewing, which is continued in a patch at the end of the cell. There are also yellowish patches at the distal margin. The subcostal of the forewing is red-brown. On the hindwing the cell and the inner margin are dusted with yellowish. On the under surface the margins are red-brown, with 3 white, dark-edged spots in the distal margin of the hindwing.

P. ilsia Schaus, also from Bolivia, is said to be smaller, with broad brown and white half-band at itsia. the end of the cell of the forewing; apex broadly brown.

P. medellina *Hsch*, (40 e), from Venezuela and Colombia, is a smaller species with fairly uniformly medellina. broad dark margins and triangular half-band as well as white spot at the end of the cell of the forewing. In the basal part both wings are dusted with vellowish. — ozia Hew. is a very similar form from Ecuador, ozia. with yellowish club to the antenna.

P. antisao Bates (40 d), from the Upper Amazon, has a sulphur-yellow oblique band at the end of antisao. the cell of the forewing to the distal margin. In the σ the median and subcostal of the forewing are only slightly yellow-brown, in the φ very broadly; here also the veins in the disc of the hindwing, as well as a more or less broad stripe in the dark distal margin, are yellow-brown.

P. simplex Salv. (40 b), from Costa Rica and Panama, has delicate wings with narrow brown mar-simplex. gins; yellow-brown subcostal and white spot at the narrow half-band of the forewing. On the under surface the veins are yellow-brown with indistinct dots at the apex. In the φ the margins are broader, halfband and white spot larger. Before the distal margins are placed whitish dots.

P. nepiscada Hsch., from southern Peru, is a similar, smaller species, which recalls forms of Epi-nepiscada. scala. Subcostal and median of the forewing are broadly yellow-brown. The spot at the end of the cell is vellowish. On the under surface an elongate vellow-brown spot is separated off at the costal margin by sulphur-yellow bordering and there are yellow dots in the apex of both wings.

P. sylvo Hbn., from Guiana, Venezuela and Brazil, in an insignificant-looking species, similar to sylvo. alissa, with wedge-shaped dark spot at the end of the cell of the forewing and white spot at the costal margin, as well as a streak at the end of the upper discocellular and a whitish patch in the hinder angle. - carlia Schaus, from Central Brazil, is probably, if not the same, at least a very similar form. earlia.

P. hemixanthe *Fldr.* (40 d), from Central Brazil, has the proximal half of both wings strongly hemixanthe. dusted with yellow. In this it resembles the smaller euritea Gott, (= eudema Godt.) (40 d), from the same curitea. district. The latter has, however, dark bands across the end of the cell and at the inner margin of the forewing, which are absent in *hemixanthe*; the present species on the other hand has a large reddish dot at the base of the hindwing beneath.

P. cotytto Guér. (40 c), from Central America and Mexico, has a broad black-brown apex to the colutto. forewing and a broad half-band at the end of the cell, together with a white oblique band, which extends to the distal margin. The subcostal is red-brown. - parva Salv., from Costa Rica, is smaller than parva. colutto, with narrower black apex to the forewing.

PTERONYMIA. By R. Haensch.

- fizella. **P. fizella** Bdv., from Guatemala, is said to be very similar to Ithomia agnosia (37 f), with the margin of the forewing widened towards the apex and quadrate spot at the end of the cell. The white oblique band reaches the distal margin.
- artena. P. artena Hew. (40 c) is said to come from Mexico, but a similar form is common in the eastern Andes from Colombia to Peru. artena has about the size and appearance of tigranes and adina. The black half-band at the end of the cell of the forewing is proximally forked, the white band ends at the third median vein. In the apex of the margins, which are red-brown beneath, are placed in the foreolimba, wing 2 white dots, in the hindwing only one. — olimba Hsch., from southern Peru, is distinguished by a
- yellow base to the hindwing beneath and yellow underside to the abdomen, which is grey in artena.
 derama.
 P. derama Hsch., also from the border of Peru and Bolivia, recalls Pseudoscada salonina (41 b). The wings are diaphanous with narrow margins. Across the end of the cell of the forewing is placed a wedge-shaped black spot and towards the apex a delicate yellow-white half-band, cut off at the 3rd median vein. On the under surface the margins are brown-red with 3 whitish dots in the apex of the forewing.
- afrania. **P. afrania** Hpfr., from Bolivia, resembles Miraleria sylvella (40 e) and Episcada salvinia (39 d), without the red-brown colouring of the subcostal and median of the forewing. The narrow black margins are broadest in the apex and at the inner margin of the forewing. Beside the narrow, uniform black band at the end of the cell is placed a similar white one.
 - apia. **P. apia** Fldr., from Colombia, is similar to *tigranes*, with narrow margins and pointed dark halfband at the end of the cell of the forewing, and also a broad white one beside it. Subcostal red-brown. On the underside the costal margin of the hindwing is yellowish at the base.
- asopo. P. asopo Fldr., from Venezuela and Colombia, is smaller than artena. The half-band at the end of the cell of the forewing is triangular; the white patch beside it proportionally broader. On the under surface there are 3 whitish spots in the apex of the forewing, 2 in that of the hindwing, as well as 3 indiasellia. stinct ones at the distal margin. — asellia Hpff. (= andreas Weeks) (40 c), from Peru and Bolivia, si a
- similar form with the triangular spot at the end of the cell broader costally and beneath not blackish but rust-brown. Moreover the white marginal spots are absent and the 2^{nd} median vein of the forewing is aselliata. In aselliata Hsch., from Ecuador, the white oblique band of the forewing is broader and
 - reaches the 2^{nd} median vein; also the white patch at the hinder angle is larger and in the Q united with the oblique band. alissa. **P. alissa** Hew. (40 c), from western Ecuador, has a somewhat curved half-band at the end of the
- alissa. P. anssa Hew. (40 c), from western Heudor, has a somewhat curved har-band at the end of the orewing active of the forewing and a small, white, black-edged spot at the costal margin. The apex of the forewing alissana, is more strongly rounded. In alissana Hsch, the forewing has also a broad white oblique band, which, however, is semitransparent and not sharply cut off at the 2nd median vein, as in the similar aselliata. It flies likewise in western Ecuador.
- **P. vestilla** Hew., from the Upper Amazon, has broader dark margins; the dark oblique band at the end of the cell is continued beyond the 2nd median vein to the distal margin. Behind it follows towards the apex a yellow oblique band. There is in addition yellow dusting in the end of the cell and at the uwaya. hinder angle of the forewing, as well as in the anterior half of the hindwing. In ucaya Hsck., from the sparsa. Ucayali River, the yellow oblique band is whitish. sparsa Hsck. is another form of vestilla, from the Upper Napo in Ecuador. The yellow dusting of the wing is much stronger, especially in the whole
 - of the hindwing, where also the veins stand out strongly yellow.
- *laura.* **P. laura** Stgr. (40 d), from Colombia. is one of the few brightly coloured small species. It is similar in colouring to Hypoleria vanilia (40 g) and *Pseudoscada lavinia* (41 b). The half-band at the end of the cell is somewhat emarginate towards the apex and encloses a white patch. In the dark shaded apical area of the forewing are placed in addition a number of whitish dots at the distal margin and in the disc. The hindwing, especially at the distal margin, is red-brown (more strongly in the \mathfrak{Q}) and with dark margins at the apical half.
- aletta. **P. aletta** Hew. and **agalla** Godm. & Salv. (40 d) are 2 very similar forms, the former from Colombia agaila. **P. aletta** Hew. and **agalla** Godm. & Salv. (40 d) are 2 very similar forms, the former from Colombia and Venezuela, the latter from Panama and Costa Rica. agalla has a sharply defined yellow oblique band at the end of the cell of the forewing and roundish spots before the distal margin. In aletta the oblique band is composed of indistinct spots, between which the lower radial remains dark. On the yellow-brown hindwing the veins in agalla are bright red-brown, in aletta blackish in the distal half. Both forms have
- alope. a broad red-brown inner margin to the forewing, whilst in a third form, **alope** Godm. & Salv., from Panama and Venezuela, which is said to be otherwise similar to *aletta*, the inner margin remains blackish. Another species similar to these forms is *Episcada polita* (39 e).
- Ulla. P. lilla Hew. (40 c) has in addition to a yellow oblique band yellow dusting in the cell of the forewing and the costal half of the hindwing, and yellow dots at the distal margin of the forewing. On the under surface the margins are brown with yellow-brown markings, only the base of the hindwing is reddish yellow-brown. In the apex of the forewing are placed beneath 4 white dots, in the distal margin of the hindwing 5 oblong double dots. In western Ecuador at the foot of the Andes.

MIRALERIA; AERIA. By R. Haensch.

P. primula Bates, from the Upper Amazon, is a species similar to vestilla; the dark oblique band at primula. the end of the cell is forked at the 2^{nd} and 3^{rd} median veins. The vitreous parts of both wings are for the most part dusted with yellow. The distal margins are broadly blackish brown, broadest in the apex of the forewing and the middle of the distal margin of the hindwing: on the under surface they are suffused with light brown, yellow-brown at the base and the inner angle of the hindwing. - tenuis Hsch. (40 c), tenuis. from Colombia, is a similar form with delicate wings. Between the 2nd and 3rd median veins of the fore-wing is placed a triangular additional yellow spot. The yellowish oblique band is arc-shaped. On the under surface the margins are paler and in the distal margin of the hindwing there are no white dots as in primula.

P. auricula Hsch. (40 c), also from eastern Colombia, is larger, with broader black margins. The auricula. proximal edge of the distal border of the hindwing is nearly straight, not parallel to the outer edge. On the under surface the edges are dark, except at the end of the cell of the forewing and at the costal and distal margins of the hindwing, where they are yellow-brown.

P. glauca Hsch., from western Ecuador, recalls Leucothyris quadrata, but the vitreous spots in the glauca. apex of the forewing are absent. The wings have a strong blue-white sheen. The oblique band at the end of the cell is forked at the median veins. At the costal margin there is only one small whitish spot. On the under surface the margins are red-brown, dark-edged; with 4 white dots in the apex of the forewing, and 5 in the apex and distal margin of the hindwing.

28. Genus: Miraleria Hsch.

Here belong only a few forms, which may be recognised by their having the end of the cell straight in the hindwing. The lower and middle discocellulars are of equal length, weakly curved and alone closing the cell, whilst both the upper discocellular and the upper radial are absent in the β . The 5 has an oblong scent-spot, which, as in Hypoleria, is not closed distally. The known forms are plainlooking, medium-sized butterflies, and occur only in the north-west of South America; they are not rare.

M. cymothoë Hew. (40 e), from Venezuela and Colombia, has colourless wings with brown margins, cymothoë. of which the distal ones are proximally dentate. The subcostal of the forewing is red-brown; the costal margin of the hindwing and all the margins on the under surface are yellow-brown. Beside the brown half-band of the forewing is placed a whitish band and in the apex of both wings on the under surface 2 whitish dots. — In ab. flavomaculata Hsch., from Venezuela, the band at the end of the cell is yellow, lata. and also the dots on the underside.

M. sylvella Hew. (40 e), from western Ecuador, closely resembles the smaller Episcada sylpha (39 e). sylvella. The 5 has in addition to the red-brown subcostal a broad streak at the median of the forewing and also a partly reddish brown distal margin to the hindwing. The half-band at the end of the cell is proximally narrower and beside it is placed only a small white spot at the costal margin. In the QQ the redbrown colour is absent above, only the subcostal of the forewing is slightly red-brown. — In ab. ornata ornata. Hsch. the forewing has a broad white half-band, which in the φ is sometimes continued, though here less distinct, to the distal margin.

29. Genus: Aeria Hbn.

Here begins the group of genera in which the lower discocellular of the hindwing in the 3 is not angled and forms an acute angle with the median. In *Aeria* the lower discocellular is slightly undulate, the middle somewhat shorter than the long upper one; in the \mathcal{Q} the lower is angled, the upper is absent, as the upper radial branches off from the subcostal. The $\mathcal{J}\mathcal{J}$ of some forms have at the end of the cell of the forewing on the upper surface a larger spot of thickly massed, glossy brown scales. The few known forms are all very nearly allied and recall species of *Scada* by their yellow-black colouring. They mostly occur in northern South America and in Central America, and are not rare in open places in the woods.

A. eurimedia Cr. (= aegle Hbn., indola Dbl. & Hew.) (40 f). Typical examples of this species occur eurimedia. only in Guiana and on the Lower Amazon. They have a large, half oval yellow subapical spot in the forewing and also broad black oblique band and margins, there being only an oblong yellow spot at the base. — In the form negricola Fldr., from the Upper Amazon, the subapical spot is longer and the yellow negricola. basal patch is broader and triangular. On the under surface of both forms the margins are variegated with red-brown. - pacifica Godm. & Salv. is the form from northern Central America. The black pacifica. markings are very broad, so that only narrow yellow stripes remain at the base of the forewing and in the disc of the hindwing. The subapical band of the forewing is very large and like the other yellow markings darker than in eurimedia. The under surface, as in the latter, is variegated with red-brown. — agna agna. Godm. & Salr. (40 f) is the form from southern Central America as well as Colombia and Venezuela. It may be recognised especially by the absence of the red-brown colour on the under surface. The pattern and colouring are otherwise similar to the preceding, with somewhat broader yellow bands at the base of the forewing and on the hindwing. — palmara Hsch. is a form from western Ecuador. It differs from aqua in palmara.

VELAMYSTA. By R. Haensch.

- sisenna, the narrower yellow subapical band and broader basal triangle on the forewing. ab. sisenna Weym, is a form of the preceding in which the yellow subapical band of the forewing is broken up into 2-3 small vellow spots. It occurs together with the principal type in Ecuador.
 - elara,

clarina.

A. elara Hew. is a smaller, delicate species from the Upper Amazon, with proximally sinuous yellow subapical band and narrower distal margin to the hindwing. On the under surface it shows the red-brown colour especially at the hinder angle of the forewing and the inner angle of the hindwing. - elarina Oberth., from the Lower Amazon, is somewhat larger, with narrower wings and brighter colouring. The special character of this form is the presence of a black triangle at the end of the cell of the hindwing, extending from the costal margin.

elodina.

olena.

A. elodina Star., from Venezuela, is pale yellow and has a narrow black oblique band across the end of the cell of the forewing, the costal and distal margins of the forewing are also black and the costal margin of the hindwing is narrowly so. *elodina* may be recognised especially by the narrow vellowish costal margin of the hindwing beneath. A. olena Weym. (40 g), the only species from Central Brazil, differs from the preceding by the ab-

sence of the white marginal dots on the under surface. It is of only small size, and has delicate, blackish colour with narrow yellow subapical band on the forewing and longitudinal band on the hindwing. The yellow basal triangle in the forewing on the contrary is broad.

30. Genus: Velamysta Hsch.

Under this name I unite a small group of species which differ from Hypoleria in the absence of the oblong scent-spot in the middle of the costal margin in the 3. Costal and subcostal in this genus separate gradually and only approach one another again behind an indistinct scent-spot which is placed at the extremity of the cell, after which, parting once more, they reach the margin in a curve. The scentspot is mostly marked by a whitish angular spot on the under surface and on the upperside covered by a hair-pencil arising at the end of the cell. In the φ costal and subcostal are coincident to one half, the upper discocellular is absent and the lower is mostly angled, which is not the case in the \mathcal{J} . There belong here only a few rare, medium-sized forms, which in the markings recall species of Leucothyris and Dismenitis. They occur apparently only in high-lying mountain-forests of the eastern Andes from Ecuador to Bolivia.

V. crucifera Hew. (40 f), from Ecuador, is similar to Dismenitis theudelinda (41 d) and V. pardalis, $erucif \epsilon ra$. but somewhat smaller. The forewing is shaded with light brown, with whitish dots, dark borders and a brown, irregular spot at the end of the cell of the forewing. The hindwing has bluish sheen and a peculiar, broad black-brown colouring at the distal margin, in which are placed large whitish distal-marginal spots. The costal margin of the hindwing is blackish to the apex with a wedge-shaped spot at the end of the cell. In the 3 the colouring is on the whole somewhat weaker than in the figured φ .

V. torquatilla Hew. (40 f. as peninna) and peninna Hew., both from Bolivia, are very similar, so that I at first regarded them as one species. Only after seeing a specimen of the true peninna I discovered my mistake and it seems to me now that the two even belong to different genera. The specimen figured is a φ of torquatilla (not peninna); in the 3 the dark markings are weaker, especially in the disc of the forewing; and on the hindwing the median band is only indicated at the apex. On the under surface all the margins are rust-brown. — In peninna the otherwise similar marking is on the whole weaker and lighter brownish. In the Q the oblique band of the hindwing is placed nearer to the distal margin.

pardalis. V. pardalis Salv. (40 e) is probably also best placed in this genus. The neuration appears to vary somewhat, as I possess a 3 with the lower discocellular of the hindwing angled. much as in Callithomia, whilst in other specimens this vein is not angled. Superficially this rather rare species recalls Dismenitis theudelinda (41 d), with which it occurs in the highest mountain-forests of the Andes in Ecuador. It may be known by the dark oblique band at the end of the cell of the hindwing and the spots between the end of the cell and the apex of the forewing. In the Q the hindwing is of the same brownish colour as the forewing. V. pupilla Hew. (40 f), from Bolivia, is smaller, with similar markings and lighter margins, especipupilla. ally the costal margin of the forewing, which is reddish. The half-band at the end of the cell and the spot in the cell of the forewing are narrower. The dark marking in the apex of the hindwing is only very weak in the ς . The φ probably resembles dispersa, if this is not indeed the φ of pupilla. — dispersa dispersa. Weym., from Bolivia, has very similar markings to the Q of torquatilla. The dark patches at the apex

and between the cell and distal margin of the forewing are fainter. — Another similar form, but somewhat Clacircilla. larger, is **cfrcilla** Hew., from Bolivia. The wings have a yellowish tint, with similar markings on the forewing to crucifera, but with vellow-red costal margin and vellow spot at the end of the cell. The hindwing has in the φ a proximally dentate dark distal margin, with 2 white dots at the apex and a halfband at the end of the cell.

V. anomala Star., from the Cauca Valley, has almost unmarked wings and recalls Episcada canilla (39 c) and paradoxa. The 33, however, have the characteristic white spot at the costal margin of the hindwing beneath. The wings have a slightly yellow-green appearance, with no other markings. The costal and inner margins of the forewing are brown, the distal margins only very finely edged with dark.

torquatilla, peninna.

anomala.

HYPOLERIA. By R. Haensch.

31. Genus: Hypoleria Godm. & Salv.

The 33 may be recognised by the elongate oval scent-spot at the costal margin of the hindwing and by the non-angled lower discocellular, which forms an acute angle with the median, is curved inwards and mostly aborted at the lower radial. In the 2 costal and subcostal are coincident to the middle, otherwise the neuration is as in the 3.

The forms which belong here have mostly a rounded apex to the forewing and roundish hindwing. In addition to those with colourless wings there are also gay-coloured species, especially a group with redbrown band in the apex of the forewing, such as may be found in *Leucothyris* and also in *Pseudoscada*. Some forms also resemble the latter genus in other respects, so that it is often not easy to differentiate $\varphi\varphi$ of the two genera.

Of this not very extensive genus also the region of the eastern Andes produces the largest number of species, yet some forms also occur as far as South Brazil and in Central America.

H. vanilia H.-Schäff. (40 g), from Colombia, is very similar to the smaller *Pseudoscada lavinia* (41 b). vanilia. The forewing is shaded with dark, with black margins and 2 oblique bands at the end of the cell and before the apex. The interspace is divided by the dark-marked veins into a number of whitish spots. The hindwing is rust-brown, with broad border at the apex; in the Q with yellow-brown, proximally dark brown costal margin, in the J transparent at the costal margin. — libera Godm. & Salv. is a local form of libera. the preceding from Central America (Panama, Costa Rica). It has more strongly marked dark patches and brighter red-brown colour on the hindwing. — fumosa Godm. & Salv., from Panama, is a form of the fumosa. preceding with darkened apical spots and triangular spot in the cell of the forewing.

H. hyalinus *F.*, from Brazil, is a doubtful form and unknown to me in nature. According to *hyalinus*. BUTLER it is a form similar to *vanilia*, with transparent forewing and black margins, and also a macular band in the apex. Hindwing red-brown with narrow black distal border.

H. fausta *Stgr.*, from the Upper Amazon, is a smaller species with brownish hindwing and base of *fausta*. the forewing. Across the end of the cell of the forewing is placed a broad dark half-band, which is divided at the median veins. In the end of the cell and at the distal margin there are whitish patches.

H. alema *Hew.*, from Colombia, has according to HEWITSON'S figure transparent yellowish wings with *alema*. dark margins and narrow band across the end of the cell of the forewing; before the distal margin of the latter with whitish dots. On the under surface the margins are reddish, except the blackish costal margin of the hindwing.

H. ina *Hew.*, from Ecuador, is a similar species with a row of whitish submarginal dots at the *ina*. distal margin of the forewing and without markings at the end of the cell. The inner margin of the hindwing is broadly reddish yellow-brown. In this the species recalls *Napeogenes apulia* (35 f).

H. ocalea *Dbl. & Hew.* (41 g), from Venezuela, Trinidad and Colombia, has light yellow-brown wings ocalea. with dark margins and an oblique band across the end of the cell of the forewing, which is continued beyond the 3rd median vein. The median of the forewing and the veins of the hindwing are yellow-brown. The macular band of the forewing is yellowish. — The white, longitudinally ribbed eggs are according to GUPPY attached singly about 2 ft. above the ground. The larvae hatched in 5 days. They are transparent, green, with whitish head and take 9 days to feed up.

H. gephira Hew. (41 g), from Colombia and the adjoining parts of Central America, is a similar gephira. species with broader margins; with whitish spots in the apex of the forewing and at the distal margin of the hindwing. Moreover the veins in the distal half of both wings are black.

The following forms have a broad yellow-red subapical band in the forewing and hence resemble the similarly marked forms of *Leucothyris* and *Napeogenes*, and also certain Erycinids.

H. chrysodonia Bates, from the Upper Amazon, is almost the same size as **aureliana** Bates (= trom *chrysodonia*. bona Srka.) (41 a), from the same district. In the former the yellow-red colour is proximally semitransparent. The 2^{nd} and 3^{rd} median veins of the forewing are only narrowly margined with dark. In *aureliana* the yellow-red band is broader and the extremity of the median and also its branches are broadly margined with dark brown, so that between the veins only 2 smaller vitreous spots remain. Moreover, the base of both wings is also shaded with dark. The antennae are black in both species, whilst in **karschi** Hsch., which is otherwise very similar to *chrysodonia* and flies at the Upper Napo in Ecuador, they karschi. have a yellow-brown club. In karschi the yellow-red subapical band only reaches the 3^{rd} median vein. — Another similar form is cidonia Hew., from Colombia. In this the antennae are black and between the *cidonia*. median veins there are 2 larger colourless vitreous patches. The hindwing has a yellowish submarginal band.

H. orolina *Hew*. (40 g), occurring at the Upper Amazon as far as the foot of the Andes in Peru and *orolina*. Ecuador, is a smaller, delicate species with almost colourless wings and yellow-brown subapical band. — In oculata *Hsch.*, from the Upper Napo, which is the same size, there is another rounded vitreous spot be-oculata. tween the end of the cell and the band, which is narrower. — A similarly marked form, but larger than oculata, from Ucayali, which I call sedusa form. nov., has a white patch at the end of the cell of the sedusa.

PSEUDOSCADA. By R. Haensch.

forewing and 3 whitish dots before the distal margin. The vitreous areas of both wings are slightly shaded with brownish.

H. oncidia Bates, from the Upper Amazon, has similar markings to orolina; it is somewhat smaller oncidia. and has whitish dusting in the end of the cell and before the distal margin of the forewing, and also in tenera. the disc of the hindwing. — A very nearly allied form is tenera Srnka, from Pebas, which has 3 white dots between the median veins of the forewing, whilst only 2 of these are said to be present in oncidia. quadrona. In a further form from Yurimaguas, on the Upper Amazon, which I call quadrona form. nov., the yellowred band is only very narrow and between it and the broad band at the end of the cell of the forewing there is another whitish patch.

wing and adjoining it a white patch. The distal margin of the hindwing is red-brown, with dark edges.

H. cymo Hbn. (= galita Hew.) (41 a) has a dark half-band across the end of the cell of the fore-

cumo.

On the under surface the distal margins together with the costal margin of the hindwing are light redindecora. brown with dark edges. — In the form indecora Hsch. (= sylphis Kaye), from British Guiana, the redbrown colour at the distal margin of the hindwing is absent. At the distal margin of the forewing there are white dots, and the margins of the under surface are yellow-brown.

H. garleppi Hsch. is similar to the preceding, with narrower white patch at the end of the cell and garleppi. without the whitish dots at the apex of the forewing.

H. famina Hsch. (41 a), from Peru, has the wings more strongly dusted with white and an angular iamina. smoke-brown spot in the cell of the forewing. On the under surface the dark margins are variegated with oriana. yellow-brown. — In oriana Hew., from the Upper Amazon, the costal and distal margins of the hindwing are much broader and leave in the disc only a vitreous longitudinal band, just as in Leucothyris onega.

H. virginia Hew. (40 g), from the Amazons, has smoke-brown wings with broad dark margins and virainia. broad apex to the forewing. Across the cell of the latter is placed a wedge-shaped oblique band and towards the apex a broad, segment-shaped, white band.

As H. xenophis spec. nov. I designate an isolated species from the Rio Ucayali, with elongate, xenophis. yellow-dusted wings, which recalls Episcada canilla (39 c). The forewing has before and behind the end of the cell a dark pointed half-band, as well as dark margins. The greater part of the hindwing is dusted with yellow; it has likewise dark margins. On the under surface all the margins are red-brown, darkedged, without white marginal dots.

H. coenina Hew. (40 g) differs considerably from most of the other forms by the pointed apex of coenina. the forewing and the absence of marking at the end of the cell. The wings are dusted with grey and have adornata. fairly uniform black margins. The latter are black also beneath. - In ab. adornata Hsch, the margins are bright red-brown on the underside, especially at the base and the anal angle of the hindwing.

H. veronica Weym., from Colombia, is larger than coenina; the distal margins are proximally denveronica. tate. Across the end of the cell of the forewing there is a black triangle and at the anal angle of the hindwing a rust-coloured oblong spot. The species resembles Pteronymia thabena and tucuna.

H. oreas Weym. (41 a), from southern Brazil, has broad, glossy bluish white wings with dark maroreas. gins and on the forewing whitish dots at the distal margin. The half-band at the end of the cell is broad, proxima. especially in the Q. — A nearly allied form is proxima Weym., likewise from South Brazil. Here the wings are colourless, the margins above grey-brown and beneath yellow-brown. In oreas the margins are red-brown beneath.

H. mirza Hew. (= lavinia Hew. p., ryphaeno Oberth.) (41 a), from western Ecuador, has a narrower mirza. half-band in the forewing and whitish dots at the end of the cell and the distal margin, of which those riffarthi, before the apex are proximally bounded by a weak oblique band. - riffarthi Hsch., from Ecuador, has similar, but stronger markings. But here the forewing is further distinguished by a white half-band between discocellular and apex.

cassotis. H. cassotis Bates, from Guatemala, and rhene Godm. & Salv. (41 a), from Panama, are very similar rhene. to each other. In cassotis the half-band at the end of the cell of the forewing is proximally forked, in rhene pointed. Moreover, the cell of the hindwing is said to be much longer in rhene, the lower radial on cajona. the contrary very short. -- cajona Hsch., from south-eastern Peru, is another similar form with broader black apex to the forewing and without reddish subcostal.

32. Genus: Pseudoscada Godm. & Salv.

This genus differs from Hypoleria in the absence of the oblong scent-spot in the \mathcal{J} . Costal and subcostal are almost entirely coincident. The separation of the two genera, however, cannot be rigidly carried out, as in some species an oblong raised patch combined with an indistinct costal indicate the transition. On the other hand Pseudoscada shows also relationship to Hymenitis, so that it is doubtful to which genus some species belong.

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 \overline{V}

PSEUDOSCADA. By R. Haensch.

161

To *Pseudoscada* are referred a number of small species, some of which are also externally very similar to forms of *Hypoleria*. The sources of the Amazon and Brazil produce the most species, whilst from Central America only a few species are known from the southern part.

P. lavinia *Hew.* (= saturata *Stgr.*) (41 b), from eastern Colombia, much resembles *Hypoleria vanilia*, *lavinia*. but is smaller and the shape of the wings is different, as is also the neuration. — An allied form is troetschi *troetschi*. *Stgr.*, from Costa Rica. The base of the forewing is colourless and the hindwing has only at the dark distal margin a broad red-yellow stripe. The rest of the hindwing is colourless.

P. florula Hew., from Cayenne, has a similar pattern to the figured local form exornata Hsch. (41 b), exornata. from British Guiana. It lacks, however, the red-brown colour in the distal margin of the hindwing, which distinguishes exornata. On the under surface the margins in both forms are yellow-brown. exornata resembles Napeogenes potaronus (35 f), which likewise flies in British Guiana, and also Hypoleria cymo (41 a).

P. egla *Hew.*, from the Upper Napo, and the two following forms are very similar to *Hypoleria on-egla*. *cidia* and its allies, as well as *Napeogenes corena* (36 b). *egla* has a broad yellow-red subapical band in the forewing and at the hinder angle 2 separated, roundish vitreous spots between the median veins. — In **aureola** *Bates* (41 b) the yellow-red band is still broader, so that at the hinder angle only one larger vitreous *aureola*. spot remains. This form flies on the Upper Amazon. — In **sarepta** *Hew.*, from the Rio Negro, the yellow- *sarepta*. red band is proximally bordered by a broad brown stripe, which extends from the end of the cell beyond the 2. median vein to the hinder angle, as in *Napeogenes corena*.

P. utilla Hew. (= pusio Godm. & Salv.) (41 b), from western Colombia and Ecuador, recalls Hypo-utilla. leria mirza (41 a), but is considerably smaller and the whitish dots in the apex of the forew ng are not proximally surrounded with dark.

P. seba *Hew.*, from eastern Ecuador, has broader distal margins and no white dots at the distal margin *seba*. of the forewing, on the other hand a faint white macular oblique band at the end of the cell. — A similar form is timna *Hew.* (41 c), from Venezuela and the eastern Andes from Ecuador to Bolivia. Here the white *timna*. oblique band is stronger and the veins intersecting it are dusted with white. — Another similar form is arzalia *Hew.* (41 b), from Bolivia, with broader black apex, broader half-band at the end of the cell of the *arzalia*. forewing and a broader, arched, white oblique band.

P. adasa Hew. (41 c), from southern Brazil, is larger than the preceding, and has only a whitish spot adasa. at the end of the cell and whitish dots at the distal margin of the forewing. — acilla Hew. is a similar acilla. form, but smaller, with pointed half-band at the end of the cell and narrower distal borders. — jessica Hew. jessica. is the same size as adasa, but has a pointed half-band like acilla. It differs from the latter in the neuration of the hindwing, the lower discocellular forming a very acute angle with the median and ending proximally to the middle discocellular, in acilla on the contrary distally to it. — A fourth similar form is erruca Hew., erruca. with the distal margins more strongly dentate at the veins and white half-band beside the end of the cell on the forewing. It is said to be further distinguished from adasa by its more elegant form and to have the end of the cell of the forewing placed almost transversely to the length of the wings. — All four forms come from southern Brazil and are not easy to differentiate. They might even belong to different genera, which can only be determined with certainty from the types.

There follows now another group of forms whose 33 are distinguished by the more pointed apex of the forewing.

In **P. fallens** *Hsch.* (41 c), from Central Brazil, the basal half of both wings is dusted with yellow, *fallens*. especially in the \mathcal{Q} , which on account of the broader distal borders strongly resembles *Pteronymia euritea* (40 d). The half-band at the end of the cell of the forewing is strongly pointed. The base of the hindwing beneath is red-brown, in *euritea* yellow.

P. salonina *Hew.* (41 b), from Bolivia, has colourless wings with dark brown margins and half-band *salonina*. at the end of the cell of the forewing and also a yellowish oblique band towards the apex. — A very similar form, with somewhat broader margins, flies also in Paraguay. — As **trepotis** form. nov. I designate a form *trepotis*. like *salonina* with white instead of yellow oblique band on the forewing. It flies likewise in Bolivia. **subtilis** *Hsch.*, from eastern Ecuador, is distinguished from *salonina* by yellowish dusting on the wings and *subtilis*. weaker half-band across the end of the cell of the forewing.

P. emyra Hsch., from Central Brazil, is a similar form to arzalia. The black apex of the forewing emyra. and the triangle at the end of the cell are broader. The 3, median vein remains black in the white oblique band The distal margin of the hindwing is narrower.

DISMENITIS. By R. Haensch.

33. Genus: Dismenitis Hsch.

The species of this genus were formerly united with those of Hymenitis. In the 33 the lower radial of the hindwing is completely developed, hence the cell is closed. In the \mathcal{Q} the upper radial is partly coincident with the subcostal; the lower radial is distinctly present; the lower discocellular is angled, with short upper arm and recurrent vein.

The genus contains for the most part imposing-looking species, some of them brightly coloured, which inhabit especially the high mountain range of the eastern Andes near the Equator. Some species also fly in the mountains of Central America.

zavaleta.

- D. zavaleta Hew. (41 c), from Colombia and Peru, has yellow-dusted wings, a transverse band in the cell of the forewing and broad black distal margin to the hindwing with white dots. The distal half of amaretta. the antenna is yellowish. - In the form amaretta Hsch., from eastern Ecuador, the transverse band through the cell of the forewing is absent, on the other hand the basal third of the cell is dark-shaded. The distal margin of the hindwing is narrower and the white dots are smaller. In the \circ the base of the hindwing is matronalis. broadly black. - matronalis Weym., from Ecuador and the Upper Amazon, is a form of zavaleta in which telesilla the white marginal dots are entirely absent above and beneath. - telesilla Hew., from western Ecuador, has a similar 3 to amaretta, with weaker yellow dusting and without the dark half-band across the end of the cell of the forewing. The distal margin of the hindwing is broader with very small white dots. The φ , in which the distal margin of the hindwing is twice as broad, may be recognised especially by a large red-yellow spot at the inner margin of the hindwing.
 - **D.** gonussa Hew. (41 c, d, $\vec{\sigma}$, Ω), from Colombia, is somewhat larger than the preceding species. The gonussa. \mathcal{J} is similarly marked to the \mathcal{Q} of zavaleta. The half-band at the end of the cell of the forewing is broader and the wing has white marginal dots on the upper surface also. In the Q the black markings are much broader and the yellow dusting of the 3 is in this red-brown. The white marginal dots of the hindwing petersi, are much larger. - petersi Dew., also from Colombia, is a form of the preceding in which the red-brown colour on the forewing and at the apex of the hindwing becomes bright yellow.
 - D. zygia Godm. & Salv. (41 d), from Costa Rica, is similar to gonussa. In the 3 not only the transzygia. verse band in the cell but also the whole of the forewing is shaded with dark. The yellowish spots round the end of the cell are larger and joined into a band. The disc of the hindwing is brownish yellow near the veins, especially at the inner margin. In the Q the inner margin of the forewing is red-brown in the middle as far as the median, as is also the entire disc of the hindwing. The black distal margin is narrower sosunga. than in gonussa and not proximally dentate at the veins. - sosunga Reak, is a form from Honduras with broader yellow oblique band on the forewing and broadly blackish apex to the hindwing. Hence in the 3 only the basal half of the hindwing is red brown.
- dircenna **D.** dircenna *Fldr.* (41 c) strongly recalls certain species of the genus *Dircenna*, such as *epidero*, etc., but may be recognised by the neuration of the hindwing. The forewing has 2 narrow half-bands across the end of the cell and through the middle of it. The black distal margin of the hindwing is broadened and dentate at the anal angle and in the Q there is a roundish black spot at the end of the cell. This interesting *pittheis*, species flies in the eastern Andes from Colombia to Bolivia. — **pittheis** Weym., from Colombia, is a similar form, without the bands on the hindwing and with diaphanous forewing. On the under surface the margins barretti, are yellow-brown, with a white dot at the apex and the distal margin of the hindwing. - barretti Dan. is another similar form from Peru without the bands in the cell of the forewing and at the end of the cell and the distal margin of the hindwing. There are 4 white dots in the black distal margin of the hindwing above.
 - D. duilia Hew. (41 d) is one of the largest and most beautiful species of the whole family. When duilia. the sunlight falls on the bluish-white-dusted wings the most magnificent colour effects are produced. On the forewing the veins and margins are edged with dark brown, only beyond the end of the cell at the costal margin there is a yellow-red stripe. The hindwing has a broad dark brown costal margin and a broad redbrown inner margin as far as the 1. median vein. duilia flies in the eastern Andes from Colombia to Bolivia and is not rare at certain places. A deceptively similar species is the smaller Hymenitis alphesiboea (41 f).
 - nepos. Another similar form is nepos Weym. (= lora Stgr.), from Colombia. The streak at the costal margin of the forewing is only half as long and yellow-brown. The costal margin of the hindwing is much more narrowly bordered with dark. The inner margin is likewise narrower and dark brown, only reddish at the base. The neuration is also somewhat different.
- D. theudelinda Hew. (41 d), from the eastern Andes from Colombia to Peru, is very similar to Veltheudelinda. amysta pardalis (40 e). But the band-like marking at the apex of both wings is absent, on the other hand a dark spot is placed at the end of the cell of the hindwing. The marking is fairly similar in both sexes. hermana. - hermana Hsch., from Ecuador, is a very similar form. In the 3 the costal and subcostal of the hindwing

HYMENITIS. By R. Haensch.

are coincident to the end of the cell; only one hair-pencil is present, the upper radial is absent. The dark spots at the end of the cell on both wings are smaller. The white marginal dots of the hindwing are triangular. — zalmunna Hew., from Ecuador and Peru, is another similar form with narrower margins, narrower zalmunna. marking across the end of the cell of the forewing and without a spot across that of the hindwing in the \mathcal{J} .

D. cleomella *Hew.*, from Bolivia, is likewise similar to *theudelinda*, but the yellowish club of the antenna *cleomella*. is distinctive. The costal margin of the forewing is not yellow-brown. Both wings have yellow tone. The pattern is somewhat different from that of *theudelinda*. The distal margin of the forewing is more broadly margined with black between the teeth. The white marginal dots of the hindwing are smaller. The spots at the end of the cell on both wings narrower, band-like.

D. crinippa *Hew.* (41 d), from Bolivia, has brown, dentate distal margins and in addition to the half- *crinippa*. band of the forewing a spot in the cell, as well as yellowish dots at the end of the cell and before the distal margins.

A similar, somewhat smaller species, which I call **D. lauta** spec. nov., differs especially in the ab-*lauta*. sence of the band-spot in the cell of the forewing. It is very similar to *Hymenitis umbrosa*, from which it may be distinguished both by the size and the different neuration. In the \mathcal{Q} the two white dots of *umbrosa* at the apex of the hindwing beneath are wanting.

In **D. cleonica** *Hew.* (41 e), from eastern Colombia and Ecuador, the markings are similar, without *cleonica*. the spot in the cell of the forewing and with yellowish colour in the basal half of the hindwing and a white spot at the end of the cell of the forewing. — **panthyale** *Fldr.*, from Colombia, is similar to the preceding, *panthyale*. without the yellowish colour on the hindwing and with red-brown subcostal and median to the forewing.

D. hewitsoni *Hsch.* (41 e), from eastern Ecuador, has transparent wings with yellow-brown sheen, *hewitsoni*. with fine, darker margins and no other markings. Subcostal and inner margin of the forewing are light brown.

34. Genus: Hymenitis Hbn.

In this genus the lower discocellular of the \mathcal{J} is not angled and is undeveloped towards the costal margin, hence the cell open. The principal difference from *Dismenitis* is seen in the QQ. In these the upper radial of the hindwing is coincident with the subcostal to one-half, in *Hymenitis* it is coincident with the lower radial half-way. Hence the middle discocellular is absent here.

To Hymenitis belong mostly medium-sized, plain-looking forms, which resemble certain species of Leucothyris and Pteronymia, but may be recognised by the non-angled, slightly curved lower discocellular, which closes the cell almost alone. Some larger species recall forms of Velamysta and Dismenitis in the pattern and colouring. This genus is rather rich in species, of which the south-west of South America produces the largest number, but Central America and Mexico have also some characteristic forms.

H. albinotata Btlr. (41 g), from Colombia, recalls Velamysta crucifera (40 f) and torquatilla (40 f) by albinotata. the dark markings of the hindwing; the forewing is similar to that of Dismenitis gonussa (41 c, d). The colour is yellowish, at the base of both wings red-brown. Particularly striking are the two white dots in the apex of the forewing. — kedema Hew., from Venezuela, is a similar, smaller form with weaker, pale kedema. colouring and indistinct band-marking at the distal margin of the hindwing. — furina Godm. & Salv. is a form furina. of albinotata from Panama with dark base to the cell of the forewing, lighter base to the hindwing and weaker black markings at the distal margin of the hindwing.

H. andromica Hew. (41 f), from Venezuela, Colombia and western Ecuador, and its subspecies are andromica, some of the commonest and most widely distributed local forms. In typical andromica the colourless wings have a slight smoke-brown tinge and black-brown margins and patches. Beside the pointed half-band of the forewing runs a broad, undulate white oblique band from the costal to the distal margin. In the apex are placed 2 whitish vitreous spots, which in the Q are completely enclosed by the broad black apex. — As **dromica** STATDINGER (*i. l.*) designated a smaller form from Colombia with narrow margins, weak half-band dromica. and narrow white oblique band at the end of the cell of the forewing. — **andania** Hpifr. (= lyrina Stgr. andania. *i. l.*) is a form from eastern Ecuador, Peru and Bolivia with vitreous, black-margined wings and interrupted white oblique band on the forewing. The apex of the forewing is more narrowly black and in the Q the hyaline spots are not proximally bordered with black. — **lyra** Salv. is the form from Central America (Guate- *lyra*. mala, Costa Rica). It is distinguished from andania by having the half-band of uniform breadth and not pointed, and a narrower white macular oblique band on the forewing. The black tooth bordering the subapical hyaline spots at the costal margin is absent.

H. nero Hew. (41 e), from Central America, Costa Rica to Mexico, is similar to the preceding, larger, *nero*, with broader margins and patches. The subcostal of the forewing and the distal margins are partly redbrown. On the underside of the forewing the 2 white apical dots of *lyra* are absent.

HYMENITIS. By R. Haensch.

- oto. **H. oto** Hew. (41 e), from Honduras and Guatemala, has broad black apex to the forewing and a broad half-band at the end of the cell as well as a white oblique band. The subcostal of the forewing and the distal margin of the hindwing are partly red-brown.
- morgane. H. morgane Hbn.-G. (41 e), from Mexico and Honduras, is noteworthy on account of the rust-brown margins. Behind the irregular half-band at the end of the cell of the forewing an indistinct, narrow white moschion. macular band runs from the costal to the distal margin. In moschion Godm., from Mexico, the rust-brown apex and the half-band across the end of the cell of the forewing are said to be narrower; the white spots do not form a distinct band; the genitalia of the 33 differ from those of morgane.
- annetta. **H. annetta** Guér., from Mexico and Central America, is smaller than morgane, with narrower, dark brown margins and a half-band on the forewing. From the end of the cell to the distal margin of the forewing runs a row of white spots, which are not parallel with the dark half-band, much as in *Pteronymia* simplex (40 b). In addition there are 2 white dots at the apex and one at the hinder angle.
- nerina. H. nerina Hsch., from Colombia, is of the same size as andromica and has similar markings to nero (41 e). The white oblique band of the forewing is broken up into spots. The margins are brown-grey above and light brown beneath, with 2 white dots in the apex of the forewing and one in that of the hindwing.
- polissena. H. polissena Hew., from western Ecuador, closely resembles a form from Costa Rica which I call umbrana. umbrana form. nov. (41 f). Both forms have diaphanous wings with narrow black margins and pointed half-band at the end of the cell of the forewing, and also white dots at the end of the cell and the distal margin of the forewing. umbrana has further white dots at the apex of both wings, polissena on the contrary only 2 white dots in the red-brown apex of the forewing beneath. In umbrana the abdomen beneath is whitish, in polissena yellowish. In the ♀♀ the margins and half-bands and also the white spots are broader.
- diaphanus. H. diaphanus Drury (= unzerina Hbst.), from the Antilles (Jamaica), which is also said to occur in Texas, is a similar species with narrow distal margin to the forewing and fine distal border to the hindwing. The half-band at the end of the cell of the forewing is of uniform breadth.
 - cubana. **H. cubana** *H.-Schäff.*, from Cuba, has similar markings to oto, but very narrow wings and narrower margins. The half-band of the forewing is constricted in the middle and forked at the median. The white oblique band is narrower than in oto.
- alphesiboea. H. alphesiboea Hew. (41 f), from eastern Ecuador, is a copy on a small scale of Dismenitis duilia (41 d) and apart from the size can only be recognised with certainty by the different neuration. In the φ the upper radial of the hindwing is coincident with the lower to one-half, in duilia with the subcostal.
 - ortygia. H. ortygia Weym. (41 f), likewise from the eastern slopes of the Andes in Ecuador, stands in the same relation to *Dismenitis cleonica* (41 e). In the figure of the 3° the white dots at the end of the cell and the distal margin of the forewing stand out too little; in the 9 they are much stronger.
 - enigma. H. enigma Hsch. (41 f), from Bolivia, has yellow-brown costal margin of the forewing and dark brown, dentate distal margins, and also yellowish patches at the end of the cell of the forewing and before the distal umbrosa. margins. On the under surface all the margins are ochre-coloured. A similar form is umbrosa Hsch., from the high mountains of the eastern chain of the Andes in Ecuador. In it the margins are narrower, the yellow patches more indistinct, and in the forewing only the subcostal is yellow-brown. In the 3 the esula. end of the cell of the forewing has no marking. esula Hew., from Colombia, is similar to the preceding;
- the margins are still narrower, the yellow patches are absent, on the other hand the hindwing is yellowish at the inner angle. Moreover in the φ also the end of the cell of the forewing is without marking. *depauperata*. **depauperata** Bdv, from Guatemala, which is unknown to me in nature, is probably a form similar to *eniqua*.
 - It is said also to resemble *zalmunna* and to be distinguished from it by the narrower distal margin of the hindwing and the absence of the white spots.
 - sappho. A species from Bolivia which I received as H. sappho (Bang.-H. i. l.), of the same size as the preceding, has colourless wings with black-brown margins, of which the distal ones are dentate at the veins. Beside the irregular half-band at the end of the cell of the forewing is placed at the costal margin a white spot, and at the distal margin of both wings there are small whitish patches. Beneath the margins are deep red-brown, at the base of the hindwing yellow-brown.
 - gardneri. H. gardneri Weeks, from Bolivia, is a similar form to pittheis, without the band in the cell of the forewing. The costal margin of the forewing is red-brown to the end of the cell. At the end of the cell of the forewing and before the distal margins are placed white patches.
 - libethris. H. libethris Fldr. (41 f), from Colombia to Peru, and a number of similar forms are distinguished derectis. by a bright yellow oblique band in the forewing. libethris differs from the very similar derectis Dbl. & Hew., from Venezuela, Colombia and Ecuador, in the more elongated forewing and the shorter inner margin of oehretis. the hindwing. Moreover the base of the hindwing beneath is yellow. ochretis Hsch., from Colombia to Bolivia, is of the same size and shape as derectis. The oblique band of the forewing is broken up into 2 yellow-brown spots. In the apex of each wing there are 2—3 further yellowish patches. The base of the hind-wing beneath is yellow, on the other hand the white dots in the apex of the forewing are absent.

HETEROSAIS. By R. Haensch. - Addenda. - Alphabetical List.

H. lydia Weym., from Ecuador, has a broad, yellow-brown costal margin to the forewing, in which lydia. it recalls Pteronymia apuleia (40 a) and Hymenitis enigma (41 f). The pattern is as in ochretis, with smaller, indistinct, yellowish patches.

H. quinta Stgr., from the Cauca Valley in Colombia, is one of the Ithomiids which are entirely with- quinta. out markings on the wings and recalls the very similar Episcada paradoxa, with which it also agrees in size, and also Velamysta anomala, Napeogenes hypsaea, Ithomia dimidiata and other forms with unmarked, colourless or yellowish wings. quinta is distinguishable from the similar species of other genera by the large, non-angled lower discocellular of the hindwing, which almost alone closes the cell.

35. Genus: Heterosais Godm. & Salv.

In this last genus of the Ithomiids the cell of the hindwing in the $\vec{\sigma}\vec{\sigma}$ is open, the middle discocellular and upper radial being absent. The subcostal is strongly developed and curved in the middle. The lower discocellular is directed proximad and forms with the lower radial an acute angle, from the point of which a vein runs into the open cell. In the Q the cell is closed, as the lower discocellular is angled and reaches to the upper. Middle discocellular and upper radial are absent here also.

The species of this genus are not numerous. They occur mostly in the north-west of South America and the adjoining districts of Central America. They are mostly inconspicuous forms of medium size, which are found with the similar species of other genera in the undergrowth of the primeval forests.

H. nephele Bates, from the Upper Amazon, and gedera Hew. (41 g), from eastern Ecuador and Col- nephele. ombia, are two very similar forms. Both have vitreous wings with bluish sheen and black-brown margins gedera. and half-band on the forewing in addition to a white spot at the end of the cell and 2 whitish patches in the apex of the forewing and on its underside 2 more white dots in the distal margin; in the distal margin of the hindwing a row of dark edged white dots. - edessa Hew. (41 g) is a similar form from southern edcssa. Brazil with smaller white spot at the end of the cell of the forewing, yellow-brown margins on the under surface and light base to the hindwing.

H. pallidula Hsch., from western Ecuador, has yellowish wings with yellow-brown subcostal and pallidula. a broad stripe on the median of the forewing. The other margins are dark brown, only the distal margin of the hindwing is partly variegated with yellow-brown. At the end of the cell of the forewing and the distal margins there are yellowish dots. In the \mathcal{Q} only the subcostal of the forewing is yellow-brown, the other margins are brown.

H. giulia Hew. (41 g), from Colombia and Venezuela, has a similar of to pallidula, with broad yellow- giulia. brown subcostal vein and stronger yellowish dots. The φ is quite similar, but more brightly marked, with broader margins, yellow oblique band on the forewing and large yellowish dots at the distal margin.

H. cadra Godm. & Salv., from Panama, is said to be similar to nephele and giulia. The wings are cadra. colourless. The dark half-band of the forewing is proximally broader, the band beside it is white, the inner margin yellow-brown.

Addenda.

Napeogenes domiduca Hew. very closely approaches some Leucothyris, such as Leuc. cyrcne; further domiduca. details are given under the latter, p. 148; from Bolivia.

Alphabetical List

with reference to the original description of the forms of the American Danaidae. signifies that the form is also figured at the place cited.

abida Hyposc. Ilew. Exot. Butt. 4.*	agalla Pter, Godm. & Salv. Biol. CentrAm. Rhop., p. 47
acceptabilis Cer. Weeks, Proc. New Engld. Zool. Club, 3, p. 1.	agarista Leuc. Fldr. Wien. Ent. Mon. 6, p. 77.
achaea Cer. Hew. Equat. Lep., p. 14.	agna Aer, Godm, & Salv, Biol. CentrAmer. Rhop., p. 15.
acilla Pseudosc, Hew, Exot, Butt, 4.*	agnosia Ith. Hew, Exot. Butt. 1. *
acrisione Ath. Hew. Equat. Lep., p. 12.	agripping Epith. Hew. Exot. Butt. 3. *
adasa Pseudosc. Hew. Exot. Butt. 1. *	albescens It. Disl. Proc. Ent. Soc. Lond. 1876, p. XI.
adelinda Cer. Hew. Exot. Butt. 4.*	albeseens Mech. Hsch. Berl. Ent. Zeitschr. 50. p. 148.
adelphe Nap. Bat. Trans. Linn. Soc. Lond. 22, p. 534.	albicans Pter. Hsch. Berl. Ent. Zeitschr, 50, p. 173.
adelphina Hyposc. Bul. Ent. Month. Mag. 3, p. 52.	albinotata Hym. Btlr. Cist, Entomol. 1, p. 153.
adina Pter. Hew. Exot. Butt. 1.*	albomaculata Tith. Hsch. Berl. Ent. Zeitschr, 48, p. 160.
adornata Hypol. Hsch. Berl. Ent. Zeitschr. 48, p. 206.	alcmena Pter. Godm. & Salv. Proc. Zool. Soc. Lond. 1877, p.61.
adulta Nap. Hsch. Berl. Ent. Zeitschr. 50, p. 157.	alema Hypol. Hew. Exot. Butt. 2.*
aedesia Apr. Dbl. & Hew. Gen. Diurn. Lep. *	aletta Pter. Hew. Exot. Butt. 1. *
aegineta Pter. Hew. Equat. Lep., p. 17.	alexina Leuc. Hew. Exot. Butt. 2.*
aegle Leuc. F. Gen. Ins. p. 255.	alexirrhoë Call. Bal. Trans. Linn. Soc. Lond. 23, p. 522.
aelia Ith. Hew. Exot. Butt. 1. *	alida Pter. Hew. Exot. Butt. 1, * .
aemilia Cer, Hew. Equat. Lep., p. 15.	alidella Episc. Hew. Exot. Butt. 4.*
aesion Hypose, Godm. & Salv. Ann. Mag. Nat. Hist, (5)	alienassa Ith. Hsch. Berl. Ent. Zeitschr. 50, p. 163.
2, p. 258.	alina Pter. Hsch. Seitz, Macrolep. 5, p. 153.
aethna Nap. Hew. Equat. Lep., p. 15.	alinda Pter. Fldr. Novara Lep. 3, p. 362.
airania Pter Hnffr Stett Ztg 1874 n 341	alissa Pter Hew Equat Lep p 22

alissana Pter, *Hsch.* Berl, Ent. Zeitschr. 48, p. 201. alope Pter. *Godm. & Sale.* Biol. Centr.-Amer. Rhop., p. 43. alphaesiboea Hym. *Hew.* Equat. Lep., p. 17. alpho Epith. *Fildr.* Novara Lep. 3, p. 359. amaldia Leue. *Hew.* Exot. Butt. 2. * amaldia Leue. *Hew.* Exot. Butt. 2. * alphesiboea Hym. Hew. Equat. Lep., p. 17. alpho Epith. Fldr. Novara Lep. 3, p. 359. amalda Leuc. Hew. Exot. Butt. 2.* amaldina Leuc. Hsch. Seitz, Macrolep. 5, p. 149. amarga Athyrt. Hsch. Seitz, Macrolep. 5, p. 121. amara Nap. Godm. Ann. Mag. Nat. Hist. 1898, 3, p. 158. amaretia Dism. Hsch. Berl. Ent. Zeitschr. 48, p. 207. amarila Ith. Hsch. Berl. Ent. Zeitschr. 48, p. 184.* amazona Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 184.* amarona Leuc. Hsch. Berl. Ent. Zeitschr. 50, p. 168.* amilia as Cada Hsch. Berl. Ent. Zeitschr. 50, p. 162.* amachoreta Hirs. Thieme, Berl. Ent. Zeitschr. 1902, p. 282. amaphissa Ith. H.-Schäff. Prodrom. Syst. Lep. 1, p. 49. anastasia Cer. Bat. Trans. Linn. Soc. Lond. 23, p. 526. amastasina Cer. Stgr. Exot. Tagf. 1, p. 60. amational Hymo. Hew. Fxot. Butt. 1.* andornica Hym. Heff., Stett. Ztg. 1874, p. 341. andromica Hym. Hew. Fxot. Butt. 1.* angelina Cer. Hsch. Berl. Ent. Zeitschr. 50, p. 154. anina Mel. Hsch. Seitz, Macrolep. 5, p. 123. annetta Hym. Gref. Ekgne Anim. Ins., p. 470. anomala Vel. Stgr. Exot. Tagf. 1, p. 69.* antaxis Leuc. Hsch. Seitz, Macrolep. 5, p. 147. antonia Cer. Hew. Equat. Lep., p. 20. antisao Pter. Bal. Trans. Linn. Soc. Lond. 23, p. 544. antonia Cer. Hew. Equat. Lep., p. 14. antonia Cer. Stgr. Exot. Tagf. 1, p. 60.* appleinis Cer. Stgr. Exot. Butt. 4.* applia Nap. Hew. Exot. Butt. 1.* artena Mech. Hsch. Seitz, Macrolep. 5, p. 126. archippus Dan. F. Ent. Syst. HII. 1, p. 49. artena Mech. Hsch. Seitz, Macrolep. 5, p. 126. artena Mech. Hsch. Sei ardea Ih. Her. Exot. Butt. 1.* ardea Pter. Hev. Exot. Butt. 1.* artena Pter. Hev. Exot. Butt. 1.* arzalia Pseudosc. Hev. Exot. Butt. 5.* asopo Pter. Fldr. Novara Lep. 3, p. 363. asellia Pter. Hsch. Berl. Ent. Zeitschr. 48, p. 201. assimilis Hirs. Hsch. Berl. Ent. Zeitschr. 50, p. 143. assimilis Leuc. Hsch. Berl. Ent. Zeitschr. 50, p. 143. assimilis Leuc. Hsch. Berl. Ent. Zeitschr. 50, p. 155. astraea Leuc. Cr. Pap. Exot. 1, p. 33.* atagaing Cer. Hsch. Berl. Ent. Zeitschr. 50, p. 156. atergatis Lyc. Dbl. & Hew. Gen. Diurn. Lep.* athalina Leuc. Stgr. Exot. Tagf. 1, p. 66.* attalia Leuc. Hsch. Berl. Ent. Zeitschr. 50, p. 168. aureliana Hypol. Bed. Trans. Linn. Soc. Lond. 23, p. 546. aureliana Hypol. Bed. Trans. Linn. Soc. Lond. 23, p. 547. aurelian Hypol. Bed. Trans. Linn. Soc. Lond. 23, p. 546. aureliana Hypol. Bed. Trans. Linn. Soc. Lond. 23, p. 546. aureliana Hypol. Bed. Trans. Linn. Soc. Lond. 23, p. 546. aureliana Hypol. Bed. Trans. Linn. Soc. Lond. 23, p. 546. aureliana Hypol. Bed. Trans. Linn. Soc. Lond. 23, p. 546. aureliana Hypol. Bed. Trans. Linn. Soc. Lond. 30.* acela Nap. Hsch. Berl. Ent. Zeitschr. 50, p. 174.* avaela Nap. Hsch. Berl. Ent. Zeitschr. 48, p. 176. azara Callol Weyn. Berl. Ent. Zeitschr. 48, p. 176. azara Callol Weyn. Berl. Ent. Zeitschr. 48, p. 193. baizana Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 193. baizana Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 193. baizana Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 193. baizana Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 193. baizana Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 193. barille Pter. Hsch. Berl. Ent. Zeitschr. 48, p. 193. barille Pter. Hsch. Berl. Ent. Zeitschr. 48, p. 193. barille Pter. Hsch. Berl. Ent. Zeitschr. 48, p. 193. barille Pter. Hsch. Berl. Ent. Zeitschr. 48, p. 193. barille Dirc. Real. Frans. Linn. Soc. Lond. 23, p. 554. barilla Pter. Hsch. Berl. Ent. Zeitschr. 48, p. 195.* berenice Dan. Cr. Pap. Exot. Ht. p. 22.* berenice Dan. Cr. Pap. Exot. Ht. p. 23.* berenice Dan. Cr. Pap. Exot. Ht. p. 23.* ber

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celemia 1th. Hew. Exot. Butt. 1.*
ceres Lyc. Cr. Pap. Exot. 1. p. 141.*
ceto Apr. Fldr. Novara Lep. HI, p. 353.
chanehamaya Callol. Hsch. Berl. Ent Zeitschr. 50, p. 165.*
chimebarzana Mech. Bad. Ent. Month. Mag. I, p. 33.
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chirysodonia Hypol. Bat. Trans. Linn. Soc. Lond. 23, p.546.*
cidonia Hypol. Bat. Trans. Linn. Soc. Lond. 23, p.546.*
cidonia Hypol. Bat. Trans. Linn. Soc. Lond. 23, p.546.*
cidonia Hypol. Bat. Trans. Linn. Soc. Lond. 23, p. 546.*
cidonia Hypol. Hew. Exot. Butt. 2.*
ciansina Episc. Hew. Exot. Butt. 5.*
clearista Ath. Dbl. & Hew. Gen. Diurn. Lep.*
cleiobaea Lyc. Godl. Enc. Moth. Mag. I, p. 33.
cleobaea Lyc. Godl. Enc. Meth. IX, p. 222.
cleobania Dism. Hew. Exot. Butt. 5.*
cleonica Dism. Hew. Exot. Butt. 4.*
cleonica Dism. Hew. Exot. Butt. 4.
cleonica Dism. Hew. Exot. Butt. 4.
cleonica Dism. Hew. Exot. Butt. 4. eleophile Dan, Godl. Enc. Méth. IX, p. 185.
eleothera Dan, Godl. Enc. Méth. IX, p. 185.
eleothera Dan, Godl. Enc. Méth. IX, p. 185.
coenna Mel. Hsch. Berl. Ent. Zeitschr. 48, p. 161.
coenna Mel. Hsch. Berl. Ent. Zeitschr. 48, p. 162.
comolet Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 192.
comeolor Lyc. Star. Exot. Tagf. 1, p. 55.
confluens Leuc. Hsch. Berl. Ent. Zeitschr. 43, p. 190.
confusa Thyr. Btlr. Cist. Entomol. I, p. 151.
consobrina Hypose. Godm. & Salv. Biol. Central-Am. Butt. p. 23. Butt., p. 23. conveniens Callol. Hsch. Berl. Ent. Zeitschr. 50, p. 167 conveniens Callol. Hsch. Berl. Ent. Zeitschr. 50, p. 167
cora Episc. Hsch. Seitz, Macrolep. 5, p. 151.
corena Nap. Hew. Exot. Butt. 2.*
corytio Pter. Guér. Règne Anim. Ins., p. 472.
cotytio Pter. Guér. Règne Anim. Ins., p. 471.
cranto Nap. Fldr. Novara Lep. 3, p. 365.*
erathes Ol. Dbl. & Hew. Gen. Diurn. Lep. *
erispina Nap. Hew. Exot. Butt. 5.*
crispina Nap. Hew. Exot. Butt. 5.*
crispinilla Leuc. Hp/fr. Stett. Ztg. 1874, p. 340.
croeotes Nap. Bal. Trans. Linn. Soc. Lond. 23, p. 536.
crueitera Vel. Hew. Equat. Lep. p. 84.
cubana Hym. H.-Schöff. Corresp.-Blatt. Zool. Min. V. Regensbg. 16, p. 118.
cuparina Hirs. Bal. Trans. Linn. Soc. Lond. 23, p. 552.
eurvifascia Thyr. Weym. Stett. Ztg. 45, p. 8.*
eydou Mel. Godm.& Satv. Proc. Zool. Soc. Lond. 1879, p.151.
cymo Hypol. Hby. Smlg. Exot. Schmett. * eymol Mei, Goum. a Saut. 1966. 2001. Sole. Lond. 1879, 1917. eymol Hypol. IIba. Smlg. Exot. Schmett. * eymothoë Mir. Hew. Exot. Butt. 1. * eyrene Leuc. Lahr. Humb. Bompl. Obs. Zool. 1, p. 249.* eyrianassa Nap. Dbl. & Hew. Gen. Diurn. Lep. * eyrella Vel. Hew. Exot. Butt. 5. * eytharista Leuc. Hew. Exot. Butt. 5. *

daëta Cer. Bsd. Spec. Gén. Ins. I. * daëtina Cer. Weym. Berl. Ent. Zeitschr. 44, p. 289.* deceptus Mech. Bilr. Cist. Entomol. 1, p. 154. decolorata It. H.ch. Seitz, Macrolep. 5, p. 116.

decora Nap. Godm. Ann. Mag. Nat. Hist. 1899, 3, p. 156. decumana Cer. Godm. & Salv. Biol. Central-Am. Butt., p. 23. demeter Lyc. Fldr. Novara Lep 11, p. 352. deurieulta Pter. Hsch. Berl. Ent. Zeitschr. 50, p. 175. depauperata Hym. Bsd. Lép. Guatem., p. 34. derama Pter. Hsch. Berl. Ent. Zeitschr. 50, p. 175.* deragen It. Hsch. Berl. Ent. Zeitschr. 50, p. 175.* deragen It. Hsch. Berl. Ent. Zeitschr. 50, p. 175.* deragen It. Hsch. Berl. Ent. Zeitschr. 50, p. 175.* deragen It. Hsch. Berl. Ent. Zeitschr. 50, p. 175.* deragen It. Hsch. Exot. Butt. 1.* deragen It. Hsch. Exot. Butt. 1.* dereetis Hym. Dbt. & Hsc. Gen. Diurn. Lep.* derey Dirc. Hbn. Zutr. Exot. Schmett.* dereeis Hym. Dbt. & Her. Gen. Diurn. Lep. * derevis Hym. Dbt. & Her. Gen. Diurn. Lep. * dero Dirc. Hbn. Zutr. Exot. Schuett. * deronda Leuc. Her. Exot. Butt. 5. * derondina Leuc. Her. Exot. Butt. 5. * descoudollesi Tith. Stgr. Exot. Tagf. 1, p. 72. desenora Cer. Hsch. Berl. Ent. Zeitschr. 50, p. 148. deediu Nap. Hsch. Berl. Ent. Zeitschr. 50, p. 155. deuealiou Nap. Hsch. Berl. Ent. Zeitschr. 50, p. 160. diaphanus Hym. Drury, Ill. Exot. Ent. II. * diasia Ith. Her. Exot. Butt. 1. * didymaea Leuc. Here. Exot. Butt. 5. * dilutata Nap. Hsch. Berl. Ent. Zeitschr. 50, p. 157. dimidiata Ith. Stgr. Exot. Tagf. 1, p. 70. dimidiata Ith. Stgr. Exot. Tagf. 1, p. 70. dionaea Cer. Here. Exot. Butt. 1. * direema Dism. Fldr. Novara Lep. 3, p. 360. * disereta Lyc. Hsch. Seitz, Macrolep. 5, p. 116. diseurens Mel. Hsch. Seitz, Macrolep. 5, p. 172. * disareta Lyc. Hsch. Berl. Ent. Zeitschr. 50, p. 173. * dispersa Vel. Weym. StDb. Reise, p. 106. distincta Athyrt. Hsch. Berl. Ent. Zeitschr. 50, p. 173. * dispersa Vel. Weym. StDb. Reise, p. 106. distincta Athyrt. Hsch. Berl. Ent. Zeitschr. 50, p. 173. * dispersa Vel. Weym. StDb. Reise, p. 106. distincta Athyrt. Hsch. Berl. Ent. Zeitschr. 50, p. 144. dolabella Leuc. Here. Exot. Butt. 5. * domata Pter. Hsck. Seitz, Macrolep. 5, p. 152. dorgissides Mech. Stgr. Exot. Tagf. 1, p. 73. dorella Pter. Hsch. Seitz, Macrolep. 5, p. 152. dorella Pter. Fldr. Novara Lep. 3, p. 361. * dorilla Callol. Bat. Ent. Month. Mag. 1, p. 25. doryssides Mech. Stgr. Exot. Tagf. 1, p. 62. * doryssides Mech. Stgr. Exot. Schmett. * dromita Hym. Ilsch. Seitz, Macrolep. 5, p. 163. dtrym It. Hoh. Verz. betk. Schmett., * domica Hym. Hsch. Seitz, Macrolep. 5, p. 163. drymo Ith. Hbn. Verz. bek. Schmett., p. 9. duenna Hirs. Bat. Ent. Month. Mag. III, p. 86. duessa Nap. Hev. Exot. Butt. 2.* duilia Dism. Hev. Trans. Ent. Soc. Lond. (2) 2, p. 247. * duisa Nam. Hete. Trans. Ent. Soc. Lond. (2) 2, p. 247. *
edessa Het. Hete. Trans. Ent. Soc. Lond. (2) 2, p. 247. *
edessa Het. Hete. Trans. Ent. Soc. Lond. (2) 2, p. 247. *
edessa Het. Hete. Trans. Ent. Soc. Lond. (2) 2, p. 247. *
edessa Het. Hete. Trans. Ent. Soc. Lond. (2) 2, p. 247. *
edessa Mag. Hete. Exot. Butt. 1. *
egaënsis Mech. Bit. Cist. Entomol. 2, p. 150.
egina Mel. Cr. Pap. Exot. 2, p. 144. *
egaa Leuc. Hete. Exot. Butt. 5. *
egra Leuc. Hete. Exot. Butt. 5. *
eleonora Ith. Hete. Exot. Butt. 5. *
elodina Aer. Styr. Exot. Tagf. 1, p. 70.
elva Nap. Godm. Ann. Mag. Nat. Hist. 1899 (3), p. 156.
elvira Dirc. Weym. Berl. Ent. Zeitschr. 50, p. 177.
enania Leuc. Hsch. Berl. Ent. Zeitschr. 50, p. 179. *
epieharme Leuc. Fldr. Wien. Ent. Mon. 6, p. 77.
epiiatero Lirc. Hsch. Berl. Ent. Zeitschr. 50, p. 159. \$
epinakrena Leuc. Hsch. Berl. Ent. Zeitschr. 50, p. 169. *
cpona Ith. Hew. Equat. Lep., p. 19.
equicoloides Mech. Godm. & Salv. Trans. Ent. Soc. Lond. 1898, p. 109. 1898, p. 109. recilla Nap. *Hew.* Exot. Butt. 2. * eresimus Dan. *Cr.* Pap. Exot. H, p. 121. * erginus Dan. *Godm. & Salv.* Trans. Ent. Soc. Lond. 1897 eripus Dan. Cr. Pap. Exot. I., p. 4. * eripus Dan. Cr. Pap. Exot. Butt. 1. * escura Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 190. escura Leuc. Hseh. Berl. Ent. Zeitschr. 48, p. 190. espriella Callol. Hew. Exot. Butt. 4. * estrella Leuc. Hew. Exot. Butt. 4. * esula Hym Hew. Exot. Butt. 1. * ethica Scada Hew. Exot. Butt. 2. * ethica Mel. Godt. Enc. Méth. IX, p. 221. euchytma Dirc. Fldr. Novara Lep. 3, p. 363. euromia Nap. Godm. Ann. Mag. Nat. Hist. 1899 (3), p. 158. eupompe Cer. Hbn.-Gr. Zutr. Exot. Schmett. *

- eurimedia Cer. Cr. Pap. Exot. 2, p. 43.* euritea Pter. Cr. Pap. Exot. 3, p. 157.* euryanassa Cer. Fldr. Wien. Ent. Mon. 4, p. 101. eurydiee Mech. Hseh. Berl. Ent Zeitschr. 50, p. 147. euteles Dirc. Ersch. Trud. Russk. 8.* eva Lyc. F. Ent. Syst. HI., 1, p. 162. evanides Hyposc. Hseh. Seitz, Macrolep. 5, p. 132. evanides Hyposc. Hseh. Seitz, Macrolep. 5, p. 144. evonla Pter. Hseh. Berl. Ent. Zeitschr. 50, p. 176.* excellens Scada Srk. Berl. Ent. Zeitschr. 50, p. 128.* excelsa Cer. Fldr. Wien. Ent. Mon. 6, p. 415. exornata Pseudosc. Hseh. Berl. Ent. Zeitschr. 50, p. 177.

- exonnata Pseudosc. IIsch. Berl. Ent. Zeitschr. 50, p. 177.
 fallax Hypose. Sigr. Exot. Tagf. 1, p. 68.*
 fallax Mech. Bilr. Cist. Entomol. 1, p. 151.
 fallens Pseudosc. Hsch. Berl. Ent. Zeitschr. 50, p. 176.*
 famina Hypol. Hsch. Berl. Ent. Zeitschr. 50, p. 178.
 fasciata Leuc. IIsch. Berl. Ent. Zeitschr. 58, p. 191.
 fasciata Lyc. IIsch. Berl. Ent. Zeitschr. 58, p. 191.
 fasta Hypol. Stgr. Exot. Tagf. 1, p. 87.*
 feuella Heterosc. Hew. Exot. Butt. 1.*
 fenestrata It. IIsch. Seitz, Macrolep. 5, p. 116.
 ferra Leuc. IIsch. Seitz, Macrolep. 5, p. 116.
 ferra Leuc. Hsch. Seitz, Macrolep. 5, p. 160.
 fiametia Cer. Hew. Exot. Butt. 1.*
 fiabela Cer. Hew. Exot. Butt. 1.*
 fiabela Pter. Bsd. Lép. Guat. p. 34.
 flaeilla Hirs. Godm. & Salv. Trans. Ent. Soc. Lond, 1898, p. 105. p. 105.

- natenia riffs. Godim. & Sate. Trans. Ent. Soc. Lond, 1898, p. 105.
 flavomaculata Mir. Hsch. Berl. Ent. Zeitschr. 48, p. 211.
 flavosignata Mel. Stgr. Exot. Tagf. 1, p. 71.
 flavosignata Mel. Stgr. Exot. Tagf. 1, p. 71.
 floria Leuc. Cr. Pap. Exot. 3, p. 112.*
 florens Cer. Hsch. Seitz, Macrolep. 5, p. 146.
 flora Leuc. Cr. Pap. Exot. 3, p. 112.*
 florens Cer. Hsch. Seitz, Macrolep. 5, p. 133.
 floria Pseudosc. Hew. Exot. Butt. 1.*
 floria Ser. Hsch. Seitz, Macrolep. 5, p. 133.
 floria Pseudosc. Hew. Exot. Butt. 1.*
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 fraterna Cer. Hsch. Seitz, Macrolep. 5, p. 132.*
 fulminans Cer. Blr. Cist. Entomolog. 1, p. 152.
 fulvinargo Pter. Godm. & Salv. Biol. Centr.-Am. Rhop., p. 46.
 fulvinargo Pter. Blr. & Deite. Tiot. Entomol. 1, p. 97.
 funnati Leuc. Hsch. Berl. Ent. Zeitschr. 50, p. 170.
 funnosu Hyol. Godm. & Salv. Biol. Centr. 50, p. 170.
 funnosus Dan. Hulst, Ent. Am. H (1886), p. 182.
 furina Hirs. Stgr. Exot. Tagf. 1, p. 73.
 furina Hirs. Stgr. Exot. Tagf. 1, p. 73.
 furina Hirs. Godm. & Salv. Trans. Ent. Soc. Lond. 1898, p. 105.
- p. 105. iurina Hym. Godm. & Salv. Biol. Centr. Am. Rhop., p. 59.* iuseens Callol. Hsch. Berl. Ent. Zeitschr. 50, p. 166.

- galata Ith. Hew. Exot. Butt. 1. * galinthias Nap. Hp/fr. Stett. Ztg. 1874, p. 344. gardneri Hym. Weeks, Proc. New. Engl. Zool. Club. 3, p. 9. garleppi Hypol. Hzek. Berl. Ent. Zeitschr. 50, p. 178. gazoria Heterosc. Godt. Enc. Méth. 9, p. 214.

- gazoria Heterosc. Godt. Enc. Meth. 9, p. 214. gedera Het. Hew. Exot. Butt. 4.* gilippus Dan. Cr. Pap. Exot. Butt. 1. * gilippus Dan. Cr. Pap. Exot. I, p. 41.* gilabra Nap. Godm. Ann. Mag. Nat. Hist. 1899, 3, p. 156. glavea Pter. Hseh. Berl. Ent. Zeitschr. 48, p. 201.* glycera Nap. Godm. Ann. Mag. Nat. Hist. 1899 (3), p. 156. glycen Nap. Godm. Ann. Mag. Hist. 1899 (3), p. 156. glycen Nap. Godm. Ann. Mag. Hist. 1899 (3), p. 156. graciella Leuc. Oberth. Bull. Soc. Ent. Fr. (5) 8, p. 156. gracilis Nap. Hsch. Berl. Ent. Zeitschr. 50, p. 156. graniden Ster. Hisch. Berl. Ent. Zeitschr. 50, p. 154. graniden Pter. Hew. Equat. Lep., p. 87. gunilla Leuc. Hew. Exot. Butt. 2.* guttata Cer. Weym. Berl. Ent. Zeitschr. 44, p. 293. halia Lvc. Hbn. Sammig. Exot. Schmett. *

- gattala Cer, Weym. Berl. Ent. Zeitschr. 44, p. 293.
 halia Lyc. Hbn. Sammlg. Exot. Schmett. *
 hara Pter. Hew. Equat. Lep., p. 88.
 harbona Nap, Hew. Equat. Lep., p. 18.
 harmonia Hirs. Cr. Pap. Exot. 2, p. 142. *
 heealesina Hirs. Fldr. Novara Lep. III, p. 352.
 hedila Call. Godm. & Salv. Biol. Centr.-Am. Rhop., p. 32.
 helena Episc. Hsch. Berl. Ent. Zeitschr. 50, p. 171.
 helieaon Hirs. Godm. & Salv. Biol. Centr.-Amer. Rhop., p. 10.
 hemimelaena Nap. Godm. & Salv. Proc. Zool. Soc. Lond. 1877, p. 60.
 hemimelas Cer. Slgr. Exot. Tagf. 1, p. 59. *
 hemixanthe Pter. Fldr. Novara Lep. 3, p. 363. *

heraldiea Ith. Bal. Ent. Month. Mag. 3, p. 52. herbita Cer. Weym. Berl. Ent. Zeitschr. 44, p. 291. * hermana Dism. Hsch. Berl. Ent. Zeitschr. 48, p. 209. hermias Hirs. Godm. & Salv. Trans. Ent. Soc. Lond. 1898, hermias Hirs. Golm. & Salv. Trans. Ent. Soc. Lond. 1898, p. 106.
hermina Hirs. Hsch. Berl. Ent. Zeitschr. 48, p. 162.
hermina Hirs. Hsch. Berl. Ent. Zeitschr. 48, p. 208.
hewitsoni Dism. Hsch. Berl. Ent. Zeitschr. 48, p. 208.
hewitsoni Dism. Hsch. Berl. Ent. Zeitschr. 29, p. 121.
hezia Call. Hew. Exot. Butt. 1.*
hieetas Mel. Golm. & Salv. Troc. Zool. Soc. Lond. 1879, p. 150.
hippotamia Apr. F. Syst. Ent., p. 461.
hippothous Hirs. Golm. & Salv. Biol. Centr. Amer. Rhop., p. 11.
honesta Cer. Weym. Stett. Ztg. 45, p. 9.
honrathi Dirc. Srk. Berl. Ent. Zeitschr. 29, p. 125.*
hopfferi Callol. Weym. Berl. Ent. Zeitschr. 29, p. 125.*
humba Metch. Stgr. Exot. Tagf. 1, p. 62.*
humba Pter. Hsch. Seitz, Macrolep. 5, p. 153.
hugia Dirc. Schaus, Proc. U. St. Mus. 24, p. 383.
humboldti Tith. Latr. Humb. Bompl. Obs. Zool. 1, p. 194.*
hyala Ith. Hew. Exot. Butt. 1.* humboldi Tith. Latr. Humb. Bompl. Obs. Zool. 1, p. 194.* hyalia Ith. Hew. Exot. Butt. 1.* hyaliaus Hypol. F. Ent. Syst. 3 (1), p. 185. hydra Call. Fldr. Novara Lep. III, p. 356. hygia Nap. Godm. Ann. Mag. Nat. Hist. 1899, 3, p. 157. hymeu Episc. Hsch. Berl. Ent. Zeitschr. 50, p. 170. hymenaea Episc. Prittw. Stett. Ztg. 1865, p. 136. hymettia Ith. Stgr. Exot. Tagf. 1, p. 63. hypereia Eutr. Dol. & Hew. Gen. Diuru. Lep. 79. hyperea Nap. Stgr. Exot. Tagf. 1, p. 63. hypsaea Nap. Stgr. Exot. Tagf. 1, p. 63. ida Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 188. * idae Mel. Fldr. Wien. Ent. Mon. 6, p. 414. idina Leuc. Hsch. Berl. Ent. Zeitschr. 50, p. 167. ignorata Cer. Hsch. Berl. Ent. Zeitschr. 50, p. 151. * Herdina Leuc. Hew. Exot. Butt. 1. * ilerdinoides Leuc. Stgr. Exot. Tagf., p. 65. * ilione It. Cr. Pap. Exot. 1, p. 42. * ilisia Pter. Schaus, Proc. Un. St. Mus. 24, p. 385. immaculata Dirc. Hsch., Berl. Ent. Zeitschr. 48, p. 179. imitata Mel. Bat. Ent. Month. Mag. Lep. 55. imachia Nap. Hew. Exot. Butt. 2. * imachia Nap. Hew. Exot. Butt. 2. * ina Hypol. Hew. Exot. Butt. 2. * inachia Nap. Hew. Exot. Butt. 1. * inania Pter. Hszh. Berl. Ent. Zeitschr. 48, p. 197. indeeora Hypol. Hsch. Berl. Ent. Zeitschr. 50, p. 177. indegans Leuc. Hew. Equat. Lep., p. 84. infuscata Call. Hsch. Seitz, Macrolep. 5, p. 128. ino Apr. Fldr. Wien. Ent. Mon. 6, p. 75. insignis Ol. Sale. Ann. Nat. Hist. (4) IV, p. 163. intermedia Cer. Ellr. Cist. Entomolog. 1, p. 152. iplianassa Ith. Dbt. & Hew. Gen. Diurn. Lep. * iquitensis Nap. Stgr. Exot. Tagf. I, p. 63. * irene Hirs. Drary, III. Exot. Ent. III. * isthmia Mech. Bat. Proc. Zool. Soc. Lond. 1863, p. 247. * ithra Nap. Hew. Exot. Butt. 1. * Jamaicensis Dan. Bat. Ent. Month. Mag. I, p. 32.
jamaicensis Dan. Bat. Ent. Month. Mag. I, p. 32.
jamarilla Leuc. Hew. Exot. Butt. 3. *
jenina Dirc. Hbn. Zutr. Exot. Schmett. *
jessica Pseudosc. Hew. Exot. Butt. 4. *
jolaia Callol. Hew. Exot. Butt. I, *
juetana Mech. Hsch. Berl. Ent. Zeitschr. 48, p. 167.
jurimaguensis Mcch. Stgr. Exot. Tagf. 1, p. 62. karschi Hypol. Hsch. Berl. Ent. Zeitschr. 48, p. 204. * kedema Hym. Hew. Exot. Butt. 1. * kena Lene Hew. Esot. Butt. 5. * kedema Hym. Hew. Exot. Butt. kena Leuc. Hew. Esot. Butt. 5. kezia Hyposc, Hew. Exot. Butt. 4, * klugi Dirc. Hbn. Zutr. Exot. Schmett. * kusa Scada Hew. Exot. Butt. 5, * labotas Mech. Disl. Proc. Ent. Soc. Lond. 1876, p. XI. ladra Pter. Stgr. Exot. Tagf. 1, p. 69.* lagusa Ith. Hew. Exot. Butt. 1.* lamira Nap. Hew. Equat. Lep., p. 21. lamirus It. Latr. Humb. Bompl. Obs. Zool. II, p. 126.* lamassa It. Godm. & Salv. Trans. Ent. Soc. Lond. 1897, p. 242. laphria Cer. Dbl. & Hew. Gen. Diurn. Lep., p. 127. larilla Nap. Hew. Equat. Lep., p. 85. larina Nap. Hew. Exot. Butt. 1.*

lateiaseiata Cer. Hsch. Berl. Ent. Zeitschr. 50, p. 153.
lateilava Hirs. Hsch. Seitz, Macrolep. 5, p. 121.
lattilimbata Cer. Weym. Stüb. Reisc, p. 105.*
lattilimbata Cer. Weym. Stüb. Reisc, p. 105.*
lattiliel Tith. Slgr. Exot. Tagf. 1, p. 67.
lauta Dism. Hsch. Seitz, Macrolep. 5, p. 163.
lavinia Pseudosc. Hew. Exot. Butt. 1.*
leila Ith. Hew. Exot. Butt. 1.*
leila Ith. Hew. Exot. Butt. 1.*
leila Ith. Hew. Exot. Butt. 1.*
leuea Dirc. Cr. Pap. Exot. 3.*
leprileuri Cer. Feisth. Ann. Ent. Soc. Fr. 4, p. 631.*
leptalina Nap. Fidr. Novara Lep. 3, p. 367.*
lerda Leuc. Kyc. Ent. Month. Mag. 15, p. 153.
leueania Cer. Bat. Proc. Zool. Soc. Lond. 1863, p. 246.*
libera Hypol. Godm. & Salv. Biol. Centr.-Am. Rhop., p. 53.*
liberthris Hym. Fidr. Novara Lep. 3, p. 365.*
liberthris Hym. Fidr. Novara Lep. 3, p. 365.*
liberthris Met. Dit. & Hew. Gen. Diurn. Lep.*
lila Pter. Hew. Exot. Butt. 5.*
lobusa Episc. Hsch. Berl. Ent. Zeitschr. 50, p. 155.
lineera Pter. H.-Schäff. Prodr. Syst. Lep. 1, p. 48.
linda Ith. Hew. Exot. Butt. 5.*
lobusa Episc. Hsch. Berl. Ent. Zeitschr. 48, p. 179.
loreta Dirc. Hsch. Berl. Ent. Zeitschr. 50, p. 165.
loreta Dirc. Hsch. Berl. Ent. Zeitschr. 50, p. 168.
ueifera Mech. Hsch. Berl. Ent. Zeitschr. 50, p. 168.
ueifera Mech. Hsch. Berl. Ent. Zeitschr. 50, p. 168.
ueifera Mech. Hsch. Berl. Ent. Zeitschr. 50, p. 146.*
luphris Tith. Hsch. Seitz, Macrolep. 5, p. 119.
loreta Dirc. Hsch. Berl. Ent. Zeitschr. 50, p. 168.
ueifera Mech. Hsch. Berl. Ent. Zeitschr. 50, p. 168.
ueifere Mech. Hsch. Berl. Ent. Zeitschr. 50, p. 168.
ueifere Mech. Hsch. Berl. Ent. Zeitschr. 50, p. 168.
ueifere Mech. Hsch. Berl. Ent. Zeitschr. 50, p. 163.
lueater Mel. Bat. Ent. Seitz, Macrolep. 5, p. 119.
lurida maearia Mel. Godm. & Salv. Trans. Ent. Soc. Lond. 1898, p. 101.
maerinus Mech. Hew. Exot. Butt. II.*
maeulata Cer. Hsch. Berl. Ent. Zeitschr. 50, p. 153.
maeulata Cer. Hsch. Berl. Ent. Zeitschr. 48, p. 163.
madeira Mel. Hsch. Seitz, Macrolep. 5, p. 123.*
maelus Mel. Hew. Exot. Butt. II.*
maenacus Mel. Hew. Exot. Butt. II.*
maenacus Mel. Hew. Exot. Butt. I.*
maenacus Mel. Hew. Exot. Butt. I.*
maenacus Mel. Hew. Exot. Butt. I.*
maenac Cer. Hsch. Seitz, Macrolep. 5, p. 130.
maenac Mel. Hew. Exot. Butt. I.*
maenacus Mel. Hew. Exot. Butt. I.*
maenad Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 192.
magnifiea Mel. Hsch. Berl. Ent. Zeitschr. 50, p. 145.
majuscula Scada Hsch. Berl. Ent. Zeitschr. 50, p. 162.
makrenia Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 192.*
makrenia Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 192.*
manara Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 192.*
manora Leuc. Hsch. Berl. Ent. Zeitschr. 48, p. 192.*
manora Leuc. Schaus, Proc. U. St. Mus. 24, p. 383.
mansueus Cer. Hew. Exot. Butt. 2.*
mantineus Mech. Hew. Exot. Butt. 5.*
mantineus Mech. Hew. Exot. Butt. 5.*
mantineus Mech. Hew. Exot. Butt. 1.*
matronalis Dism. Weym. Stett. Ztg. 51, p. 282.
mauga Mel. Hsch. Seitz, Macrolep. 5, p. 173.
mazaeus Mech. Hew. Exot. Butt. I.*
matronalis Athyrt. Fldr. Wien. Ent. Mon. VI, p. 413.
mediatrix Mel. Weym. Stett. Ztg. 51, p. 282.
megaleas Call. Godm. & Salv. Trans. Ent. Soc. Lond. 1898, p. 11.
megalopolis Cer. Fldr. Novara Lep. 31.
mediatrix Mel. Meym. Stett. Ztg. 51, p. 282. maearia Mel. Godm. & Salv. Trans. Ent. Soc. Lond. 1898, p. 101. p. 111. megalopolis Cer. Fldr. Novara Lep. III, p. 360.* megara Hirs. Godt. Enc. Méth. IX, p. 223. megisto Thyr. Fldr. Wien. Ent. Mon. IV, p. 103. melanina Hirs. Hsch. Berl. Ent. Zeitschr. 50, p. 143. melanijo Apr. Bat. Ent. Month. Mag. 3, p. 50. melphis Cer. Godt. Enc. Méth. 9, p. 218. menans Cer. Hsch. Berl. Ent. Zeitschr. 50, p. 149. menapis Mech. Hew. Exot. Butt. 1.* menophilus Mel. Hew. Exot. Butt. I.* 111

Publ. 25, IV. 1910.

mergeleua Cer. Hev. Exot. Butt. 1.*
messeniua Mel. Hev. Exot. Butt. 1.*
messeniua Mel. Fldr. Novara Lep. 3, p. 356.*
messenides Mech. Fldr. Novara 3, p. 356.
meterla Cer. Hpffr. Stett. Zg. 1874, p. 346.
meterus Mech. Hev. Exot. Butt. 1.*
methonella Dirc. Weym. Stett. Zg. 1875, p. 373.*
minua Pter. Schaus, Proc. U. S. Nat. Mus. 24, p. 384
mirz Hth. Stgr. Exot. Tagf. 1, p. 70.
mira Episc. Hew. Equat. Lep., p. 88.
mirza Hypol. Hev. Equat. Lep., p. 22.
masias Mel. Hev. Exot. Butt. 1.*
memopsis Mel. Berg, An. Mus. Buen. Air. 5, p. 234.
modesta Leuc. Hsch. Berl. Ent. Zschr. 48, p. 169.*
moles Nap. Hsch. Berl. Ent. Zschr. 48, p. 169.*
moles Nap. Hsch. Berl. Ent. Zschr. 48, p. 169.*
motagui Ol. Blr. Trans. Ent. Soc. Lond. 1870, p. 490.
morgane Hym. Hon.-G. Zutr. Exot. Schmett.*
moselina Sais Hev. Exot. Butt. 4.*
mothome Mel. Hev. Exot. Butt. 4.*
muta Hyse. Berl. Ent. Zschr. 48, p. 169.*
molas Sais Hev. Exot. Butt. 2, p. 75.
monastis Hev. Exot. Berl. Ent. Zschr. 48, p. 169.*
moles Nap. Hsch. Berl. Ent. Zschr. 48, p. 169.*
molas Hirs. F. Spec. Ins. 2, p. 27.
morgane Hym. Hon.-G. Zutr. Exot. Schmett.*
moselion Hym. Godm. Biol. Centr.-Am. Rhop. 2, p. 649.
moselion Hym. Godm. Biol. Centr.-Am. Rhop. 2, p. 649.
moselion Hym. Godm. Stot. Butt. 4.*
munda Pter. Weym. Stett. Zg. 1875, p. 372.*
mutla Cer. Hew. Exot. Butt. 4.*
mula Ster. Hew. Exot. Butt. 4.*
munda Pter. Weym. Stett. Zg. 1875, p. 133.
mapho Ith. H-Schäff, Prodrom. Syst. Lep. 1, p. 48. mysotis Cer. Hsch. Seitz, Macrolep. 5, p. 133. napho Ith. H.-Schäff. Prodrom. Syst. Lep. 1, p. 48. napona Cer. Hsch. Berl. Ent. Zschr. 48, p. 171. napona Hirs. Hsch. Berl. Ent. Zschr. 48, p. 162. nausica Nap. Weym. Berl. Ent. Zschr. 44, p. 293.* negricola Cer. Fldr. Wien, Ent. Mon. 6, p. 76. megrita Ith. Reak. Proc. Ent. Soc. Phil. 5, p. 218. neitha Hirs. Hpfr. Stett. Zg. 1874, p. 377. memea Cer. Weym. Berl. Ent. Zschr. 44, p. 290.* uephele Het. Bat. Trans. Linn. Soc. Lond. 23, p. 548. meiseada Pter. Hsch. Berl. Ent. Zschr. 50, p. 175.* mero Hym. Hsch. Berl. Ent. Zschr. 50, p. 175.* mero Hym. Hsch. Berl. Ent. Zschr. 50, p. 175.* ingrimargo Ith. Rltr. Cist. Entomol. 1, p. 153. nigrippus Dan. Hsch. Seitz, Macrolep. 5, p. 113. nigroapicalis Mech. Hsch. Berl. Ent. Zschr. 50, p. 165. ingringens Chlol. Hsch. Seitz, Macrolep. 5, p. 146. nigronascens Callol. Hsch. Berl. Ent. Zschr. 50, p. 165. nikita Epith. Hsch. Seitz, Macrolep. 5, p. 140. nina Cer. Hsch. Berl. Zscht. 50, p. 150. ninonia Cer. Hsh. Sammlg. Exot. Schmett.* mise Callol. Cr. Pap. Exot. 3, p. 66.* mivous Dan. Godm., & Salv. Trans. Ent. Soc. Lond. 1897, p. 241. mar Ger. Hsch. Berl. Ent. Zschr. 50, p. 155. nords Dan. Goam. a Sate. Trans. Ent. Soc. Lo 1897, p. 241. nora Cer. Hsch. Berl. Ent. Zschr. 56, p. 155. norella Cer. Hew. Exot. Butt. II.* norellana Cer. Hsch. Berl. Ent. Zschr. 48, p. 173. notilla Pter. Bilr. & Druce, Cist. Entomol. 1, p. 96. notilia Pter. Eur. & Druce, Cist. Entomol. 1, p. 96.
oberthuri Athyrt. Srk. Berl. Ent. Zschr. 29, p. 129. *
obiseura Mech. Eur. Cist. Entomol. 1, p. 151.
obseura Mech. Eur. Cist. Entomol. 2, p. 150.
obseurata Hirs. Hsch. Seitz, Macrolep. 5, p. 120.
obseurata Hirs. Hsch. Seitz, Macrolep. 5, p. 120.
obseurata Hirs. Hsch. Berl. Ent. Zschr. 48, p. 211.
oena Cer. H.sch. Berl. Ent. Zschr. 48, p. 211.
oena Cer. H.-Schäff. Prodom. Syst. Lep. I, p. 49.
orona Mech. Druce, Proc. Zool. Soc. Lond. 1376, p. 208.
oeulata Hypol. I.Sch. Berl. Ent. Zschr. 48, p. 204. *
oena thypol. Hysch. Berl. Ent. Zschr. 44, p. 301. *
olimba Pter. Hsch. Berl. Ent. Zschr. 44, p. 301. *
olimba Pter. Hsch. Berl. Ent. Zschr. 50, p. 174. *
olivencia Mech. Bat. Trans. Linn. Soc. Lond. 23, p. 531. *
olyrina Dirc. Filer. A Druce, Cist. Entomol. 1, p. 96.
olyrina Nap. Hsch. Berl. Ent. Zschr. 50, p. 158.
oneidia Hypol. Bat. Trans. Linn. Soc. Lond. 23, p. 546.
oneidia Hypol. Bat. Trans. Linn. Soc. Lond. 23, p. 546.
oneidia Hypol. Bat. Trans. Linn. Soc. Lond. 23, p. 546.
oneidia Hypol. Bat. Trans. Linn. Soc. Lond. 23, p. 546.
oneidia Hypol. Bat. Trans. Linn. Soc. Lond. 23, p. 546.
oneidia Pter. Hew. Exot. Butt. 1. *

- onoma Callol. Hsch. Seitz, Macrolep. 5, p. 143. oreas Hypol. Weym. Berl. Ent. Zschr. 44, p. 312. * orestes Mel. Salv. Ann. Nat. Hist. (4), 7, p. 412. orestes Mel. Salv. Ann. Nat. Hist. (4), 7, p. 412. orstilla Leuc. Hew. Exot. Butt. 4. * ornata Mir. Hsch. Berl. Ent. Zschr. 48, p. 212. ortigia Scada Druce, Proc. Zool. Soc. Lond. 1876, p. 208. ortygia Scada Druce, Proc. Zool. Soc. Lond. 1876, p. 208. ortygia Hym. Weym. Stüb. Reise, p. 107. * ossuna Nap. Hew. Exot. Butt. 5. * ossuna 1th. Hsch. Seitz, Macrolep. 5, p. 142. otaxes Nap. Godm. Ann. Mag. Nat. Hist. 1899, 3, p. 157. oto Hym. Hew. Exot. Butt. 1. * oulite Cer. Hew. Exot. Butt. 2. * ovata Mech. Disl. Proc. Ent. Soc. Lond. 1876, p. XII. ozia Pter. Hew. Exot. Butt. 5. *
- pacifica Aer. Godm. & Salv. Biol. Centr.-Amer. Rhop.,

pacifica Aer. Godm. & Salv. Biol. Centr.-Amer. Rhop., p. 16.
padilla Leuc. Hew. Exot. Butt. 3. *
padearetus Nap. Godm. & Salv. Ann. Mag. Nat. Hist. (5), 2, p. 257.
pagasa Leuc. Druce, Ent. Month. Mag. 12, p. 126.
palida Apr. Godm. & Salv. Trans. Ent. Soc. Lond. 1898, p. 109.
pallidua Het. Hsch. Berl. Ent. Zschr. 48, p. 212.
palnina Aer. Hsch. Berl. Ent. Zschr. 48, p. 202.
pannar Aer. Hsch. Berl. Ent. Zschr. 50, p. 150.
pannamensis Call. Godm. & Salv. Ann. Mag. Nat. Hist. (5), 2, p. 257.

- (5), 2, p. 257. panamensis Ith. Bal. Proc. Zool. Soc. Lond. 1863, p. 244.*

- (5), c, p. 231.
 (anamensis Ith. Bal. Proc. Zool. Soc. Lond. 1863, p: 244.*
 panamensis Ith. Bal. Proc. Zool. Soc. Lond. 1863, p: 244.*
 pantherina Cer. Slgr. Exot. Tagf. 1, p. 60. *
 panthyale Dism. Fidr. Wien. Ent. Mon. 6, p. 414.
 paradoxa Episc. Slgr. Exot. Tagf. 1, p. 69. *
 paraëusis Sais Hsch. Berl. Ent. Zschr. 50, p. 161.
 parallelis Mel. Bur. Cist. Entomol. 1, p. 155.
 paraipa Episc. Hew. Equat. Lep., p. 85.
 paraipa Episc. Hew. Equat. Lep., p. 85.
 parailina Cer. Hpffr. Stett. Zg. 1874, p. 343.
 pardalis Vel. Salv. Ann. Nat. Hist. (4), 4, p. 164.
 parola Hirs. Godm. & Salv. Trans. Ent. Soc. Lond. 1898, p. 106.
 partila Dirc. Hsch. Berl. Ent. Zschr. 48, p. 180.
 parava Pter. Salv. Ann. Nat. Hist. (4), 4, p. 168.
 pasena Episc. Schaus, Proc. U. S. Nat. Mus. 24, p. 384.
 pasimeutia Lyc. Cr. Pap. Exot. IV, p. 55. *
 patilla Let. Weym. Stett. Zg. 45, p. 14. *

- pasimeutia Lyc. Cr. 'Pap. Exot. IV, p. 55.*'
 patilla Ith. Hew. Exot. Butt. 1.*
 paula Leuc. Weym. Stett. Zg. 45, p. 14.*
 pavonii Tith. Bihr. Cist. Entomol. 1, p. 156.
 pellucida Cer. Hsch. Berl. Ent. Zschr. 50, p. 154.
 pellucida Ith. Weym. Stett. Zg. 1875, p. 374.*
 perndia Nap. Hew. Exot. Butt. 1.*
 perspieua Leuc. Bihr. Trans. Ent. Soc. Lond. 1877, p. 107.
 peruana Mech. Weym. Stett. Zg. 1878, p. 419.
 peruana Mech. Weym. Stett. Zg. 1879, p. 419.
 peruensis Callol. Hsch. Berl. Ent. Zschr. 50, p. 167.
 peruensis Callol. Hsch. Berl. Ent. Zschr. 50, p. 167.
 peruensis Callol. Hsch. Berl. Ent. Zschr. 50, p. 167.
 peruensis Callol. Hsch. Berl. Ent. Zschr. 50, p. 167.
 perusina Cer. Sigr. Exot. Tagil. 1, p. 59.
 petersi Dism. Dew. Mitth. Münch. Ent. Ver. 1, p. 86.*
 phanessa Ith. H.-Schäff. Prodrom. Syst. Lep. 1, p. 49.
 pharo Nap. Fldr. Wien. Ent. Mon. 7, p. 76.
 phasianita Mech. Hsch. Berl. Ent. Zschr. 50, p. 146.*
 phalatin Meth. Hsch. Berl. Ent. Zschr. 50, p. 146.*
 phasianita Mech. Hsch. Berl. Ent. Sch. Lond. 1870, p. 489.
 phasianita Mech. Hsch. Berl. Ent. Sch. 50, p. 146.*
 phenonoč Leuc. Dbl. & Hew. Gen. Diurn. Lep.*
 pherantes Nap. Bal. Trans. Linn. Soc. Lond. 23, p. 536.
 phileoler Episc. Hew. Exot. Butt. 4.*
 philomela Call. Godm. & Salv. Trans. Ent. Soc. Lond. 1898, p. 127.*
- 1898, p. 111. pieta Pter. Salv. Ann. Nat. Hist. (4), 4, p. 166. pinthias Ilirs. Godm. & Salv. Ann. Mag. Nat. Hist. (5), pinthias Hirs, Godm. & Salv. Ann. Mag. Nat. Hist. (5), 2, p. 259.
 pittheis Dism. Weym. Stüb. Reise, p. 106. *
 plagigera Mech. Bllr. Cist. Entomol. 2, p. 150.
 plaginota lth. Bllr. & Druce. Cist. Entomol. 1, p. 95.
 plexaure Dan. Godt. Enc. Méth. IX, p. 184.
 poecila Callol. Bal. Trans. Linn. Soc. Lond. 23, p. 540.
 poecilana Callol. Hsch. Berl. Ent. Zschr. 48, p. 186.

- polisseua Hym. Hew. Exot. Butt. 3. *
 polita Epise. Weym. Berl. Ent. Zschr. 44, p. 306. *
 polymuides Cer. Hsch. Berl. Ent. Zschr. 50, p. 148.
 porrecta Callol. Hsch. Berl. Ent. Zschr. 50, p. 166.
 porsenna Cer. Srk. Berl. Ent. Zschr. 29, p. 122. *
 potaronus Nap. Kaye, Entom. Rec. 17, p. 120.
 praemona Leuc. Hsch. Seitz, Macrolep. 5, p. 146.
 praestans Ol. Godm. & Salv. Trans. Ent. Soc. Lond. 1897, p. 240.
 praestingea Enise. Husch. Berl. Ent. Zschr. 18, p. 106.
- praestigiosa Episc. Hnsch. Berl. Ent. Zschr. 48, p. 196.

- p. 110.
- promissa Sais Weym. Stett. Zg. 45, p. 11.* promiba Pter. Hew. Trans. Ent. Soc. Lond. 1870, p. 156. proxima Hypol. Weym. Berl. Ent. Zschr. 44, p. 314. psamathe Thyr. Godm. & Salv. Trans. Ent. Soc. Lond.

- psamathe Thyr. Godm. & Salv. Trans. Ent. Soc. Lond. 1908, p. 108.
 pseudethra Hirs. Btlr. Cist. Entomol. 1, p. 155.
 pseudoagalla Ith. Reb. Berl. Ent. Zschr. 46, p. 291. *
 pseudonyma Hirs. Stlyr. Iris 1894, p. 65. *
 psidii Apr. L. Mus. Ulric., p. 228.
 pteronymiensis Nap. Hsch. Berl. Ent. Zschr. 50, p. 160. *
 pulcheria Dirc. Hew. Trans. Ent. Soc. Lond. 1870, p. 154.
 pumensis Ith. Reak. Proc. Ent. Soc. Phil. 5, p. 218.

- pupilla Vel. Hew. Exol. Butt. 5. * pupilla Vel. Hew. Exol. Butt. 5. * pyrippe Cer. Hp/fr. Stett. Zg. 1874, p. 342. pyrois Nap. Bat. Trans. Linn. Soc. Lond. 23, p. 534. pyrrho Nap. Druce, Proc. Zool. Soc. 1876, p. 209. *
- quadrata Leuc. Hsch. Berl. Ent. Zschr. 48, p. 195. quadrilis Nap. Hsch. Berl. Ent. Zschr. 48, p. 174. * quadrona Hypol. Hsch. Seitz, Macrolep. 5, p. 160. quinta Hym. Slgr. Exot. Tagf. 1, p. 70. quintina Leuc. Fldr. Novara Lep. 3, p. 361. * quotidiana Scada Hsch. Berl. Ent. Zschr. 48, p. 177.
- radina Leuc. Hsch. Seitz, Macrolep. 5, p. 148. radiosa Callol. Hsch. Berl. Ent. Zschr. 48, p. 187. * ramona Leuc. Hsch. Seitz, Macrolep. 5, p. 147. randolis Apr. Hsch. Seitz, Macrolep. 5, p. 127. reekia Scada Hbn. Smlg. Exot. Schmett. * retaria scaua 100. Snig. Exot. Schnett.* referrens Lyc. Hsch. Seitz, Macrolep. 5, p. 116. regalis Tith. Stich. Berl. Ent. Zschr. 48, p. 180. relata Dirc. Bltr. & Druce, Cist. Entomol. 1, p. 95. rezia Hypos. Hsch. Berl. Ent. Zschr. 50, p. 167.* rhene Hypol. Godm. & Salv. Ann. Mag. Nat. Hist. (5) p. 250

- rhene Hypol. Godm. & Salv. Ann. Mag. Nat. Hist. (5) 2, p. 259.
 rhezia Nap. Hbu. Smlg. Exot. Schmett. *
 rhoeo Dirc. Fldr. Wien. Ent. Mon. 4, p. 102.
 riffarthi Hypol. Hsch. Berl. Ent. Zschr. 50, p. 179. *
 robusta Callol. Hsch. Berl. Ent. Zschr. 50, p. 166. *
 rosalia Sais Cr. Pap. Exot. 3, p. 89. *
 rowena Cer. Hew. Exot. Butt. II. *
 rubescens Leuc. Blr. & Druce, Cist. Entomol. 1, p. 97.
 rufocineta Episc. Salv. Ann. Nat. Hist. (4) 4, p. 167.
- salapia Ith. Hew. Exot. Butt. 1.*
 salonia Pseudosc. Hew. Exot. Butt. 1.*
 salonina Pseudosc. Hew. Exot. Butt. 1.*
 salvini Athyrt. Srk. Berl. Ent. Zschr. 29, p. 129.*
 salvinia Episc. Bal. Ent. Mon. Mag. 1, p. 34.
 santineza Leuc. Hsch. Berl. Ent. Zschr. 48, p. 192.*
 sao Episc. Hbn. Zutr. Exot. Schmett.*
 sapplo Hym. Hsch. Seitz, Macrolep. 5, p. 164.
 sarepta Pseudosc. Hew. Gen. Diurn. Lep.*
 satura Cer. Hsch. Berl. Ent. Zschr. 48, p. 172.
 saturata Mech. Godm. & Salv. Biol. Centr.-Am. Rhop.
 2, p. 642. salapia Ith. Hew. Exot. Butt. 1.* saturata Mech. Godm. & Salv. Biol. Centr.-Am. Rnop. 2, p. 642.
 sentilla Episc. Hew. Equat. Lep., p. 86. /b0
 schulzi Call. Hsch. Berl. Ent. Zschr. 50. p. ±50;-*
 scha Pseudosc. Hew. Exot. Butt. 5. *
 sedansa Hypol. Hsch. Seitz, Macrolep. 5, p. 160,
 selenides Callol. Weym. Berl. Ent. Zschr. 44, p. 302. *
 selma Cer. Hsch. Berl. Ent. Zschr. 50, p. 152,
 sem fulva Cer. Salv. Ann. Nat. Hist. (4) 4, p. 163,
 semonis Pter. Hsch. Seitz, Macrolep. 5, p. 155.

e American Danaids.
serdolis Leuc. Hsch. Seitz, Macrolep. 5, p. 148.
serrata Pter, Hsch. Berl. Ent. Zschr. 48, p. 198.
sexmaculata Leuc. Hsch. Berl. Ent. Zschr. 50, p. 172.
signata Dirc. Hsch. Berl. Ent. Zschr. 50, p. 172.
signata Dirc. Hsch. Seitz, Macrolep. 5, p. 139.
similia Hyposc. H.-Schäff. Prodrom. Syst. Lep. 1, p. 49.
singularis Callol. Reb. Berl. Ent. Zschr. 46, p. 292. *
singularis Callol. Reb. Berl. Ent. Zschr. 44, p. 268.
sodalis Nap. Hsch. Berl. Ent. Zschr. 44, p. 298. *
sodalis Nap. Hsch. Berl. Ent. Zschr. 44, p. 298. *
sodalis Nap. Hsch. Berl. Ent. Zschr. 50, p. 160.
solida Leuc. Weym. Berl. Ent. Zschr. 50, p. 163.
splendens Ith. Hsch. Berl. Ent. Zschr. 50, p. 163.
splendens Ith. Hsch. Berl. Ent. Zschr. 50, p. 163.
splendida Pter. Hsch. Berl. Ent. Zschr. 50, p. 163.
splendida Pter. Hsch. Berl. Ent. Zschr. 50, p. 163.
splendida Pter. Hsch. Berl. Ent. Zschr. 50, p. 154.
starkei Pter. Stgr. Exot. Tagf. 1, p. 68. *
statilla Cer. Hew. Exot. Butt. 1. *
steinheil Dire. Stgr. Exot. Tagf. 1, p. 58. *
stella Nap. Hew. Exot. Butt. 1. *
steheli Ol. Hsch. Berl. Ent. Zschr. 50, p. 142.
stradogsis Leuc. Hsch. Seitz, Macrolep. 5, p. 150.
subosa Leuc. Hsch. Seitz, Macrolep. 5, p. 150.
suboma Pter. Hew. Equat. Lep., p. 87.
sumona Pter. Hew. Equat. Lep., p. 86.
suphurea Episc. Hsch. Berl. Ent. Zschr. 50, p. 171.
suphurea Episc. Hsch. Berl. Ent. Zschr. 50, p. 171.
suphurae Episc. Hsch. Berl. Ent. Zschr. 50, p. 171.
suphurae Kish. Berl. Ent. Zschr. 50, p. 171.
suphurae Kish. Berl. Ent. Zschr. 50, p. 171.
suphurae Kish. Berl. Ent. Zschr. 50, p. 171.
sup

- synnova Leuc. Hew. Exot. Butt. 2.

- tabera Leuc. Hew. Equat. Lep., p. 19. taliata Leuc. Hew. Exot. Butt. 5. * tamuia Pter. Hsch. Seitz, Macrolep. 5, p. 153. tamasta Tith. Hew. Exot. Butt. 5. *

- tamasta Tith. Hew. Exot. Butt. 5.* [1 100] tamasta Tith. Hew. Exot. Butt. 5.* [20] tarapotensis Mel. Hsch. Seitz, Macrolep. 5, p. 122. tarapotensis Mel. Hsch. Seitz, Macrolep. 5, p. 124. terrieina Hirs. Hew. Exot. Butt. 11. * [20] tecta Mel. Hsch. Seitz, Macrolep. 5, p. 144. telesilla Dism. Hew. Exot. Butt. 3. * tenera Hypol. Srka. Berl. Ent. Zschr. 29, p. 128. * tenera Hypol. Srka. Berl. Ent. Zschr. 48, p. 171. terastes Nap. Hsch. Berl. Ent. Zschr. 50, p. 174. terastes Nap. Hsch. Berl. Ent. Zschr. 50, p. 158. teresita Pter. Hsch. Berl. Ent. Zschr. 50, p. 158. teresita Pter. Hew. Exot. Butt. 3. * terra Ith. Hsch. Berl. Ent. Zschr. 48, p. 183. thabena Pter. Hcw. Exot. Butt. 4. *

p. 42.

- thabena Pter. Hew. Equat. Lep., p. 18.
 thea Cer. Hew. Exot. Butt. I.*
 theatina Cer. Hsch. Seitz, Macrolep. 5, p. 131.*
 themisto Thyr. Hbn. Zutr. Exot. Schmett.*
 theon O. Bal. Ent. Month. Mag. 3, p. 50.
 theope Eutr. Godm. & Salv. Proc. Zool. Soc. Lond. 1877, theope Eutr. Goam. at Sate. Froc. 2001. Got. Lond. 1997, p. 60. thera Mel. Fldr. Novara Lep. III, p. 354. thersippus Dan. Bal. Proc. Zool. Soc. Lond. 1863, p. 243. theudelinda Dism. Hew. Exot. Butt. 5. * theudelinda Dism. Hew. Exot. Butt. 2. * thormace Call. Bal. Trans. Linn. Soc. Lond. 23, p. 523. thyra Nap. Hew. Exot. Butt. 5. * thyridiana Leuc. Hsch. Seitz, Macrolep. 5, p. 150. dicida Pter. Hew. Equat. Lep., p. 21.

- ticida Peter, Hev. Equat. Lep., p. 21. ticidelia Episc. Hew. Equat. Lep., p. 21. tigilla Leuc. Weym. Berl. Ent. Zschr. 44, p. 305. * tigraues Pter. Godm. & Satz. Biol. Centr.-Amer. Rhop.,

Alphabetical List of the American Danaids.

tigriua Cer. Druce, Proc. Zool. Soc. Lond. 1876. p. 207. *
timagenes Pter. Godm. & Salv. Ann. Nat. Hist. (6) 3, p. 352.
timna Pseudosc. Hev. Exot. Butt. 1. *
togarma Hirs. Hew. Boliv. Butt., p. 4.
tolosa Nap. Hev. Exot. Butt. 1. *
torquatilla Vel. Hew. Exot. Butt. 5. *
tosea Callol. Schaus, Proc. U. S. Nat. Mus. 24, p. 386.
translucens Ol. Hev. Ent. Month. Mag. 9, p. 83.
travella Ith. Hsch. Berl. Ent. Zschr. 48, p. 148.
tremona Leuc. Hsch. Seitz, Macrolep. 5, p. 149.
trefolor Cer. Salv. Ann. Nat. Hist. (4) 4, p. 164.
tridaetyla Call. Hev. Mith. Münch. Ent. Ver. 1, p. 86. *
trimaeulata Cer. Weym. Stüb. Reise, p. 105. *
treuneat Mech. Birl. Cir. Linn. Soc. Lond. 23, p. 544.
tunantina Nap. Bal. Trans. Linn. Soc. Lond. 23, p. 534.
tutia Callool. Hev. Exot. Butt. 1. *

ucaya Pter. Hsch. Berl. Ent. Zschr. 50, p. 174. ulla Ith. Hew. Exot. Butt. 1.* umbraua Hym. Hsch. Seitz, Macrolep. 5, p. 164. umbratilis Hirs. Bat. Ent. Month. Mag. 3, p. 86.* umbrosa Hym. Hsch. Berl. Ent. Zschr. 48, p. 21 a.* utenaia Mech. Reak. Proc. Acad. Nat. Sci. Phil. 1866, p. 241. utilla Pseudosc. Hew. Exot. Butt. 1. *

valida Leuc. Hsch. Berl. Ent. Zschr. 50, p. 168. vallina Cer. Hsch. Seitz, Macrolep. 5, p. 130. valora Cer. Hsch. Seitz, Macrolep. 5, p. 130. valora Cer. Hsch. Seitz, Macrolep. 5, p. 130. vandona Dirc. Hsch. Berl. Ent. Zschr. 48, p. 179. * vanila Hypol. H.-Schäff. Prodrom. Syst. Lep. 1, p. 47. varina Dirc. Hew. Ent. Month. Mag. 6, p. 97. veia Pter. Hew. Exot. Butt. 1. * veritabilis Mech. Btlr. Cist. Entomol. 1, p. 155. veronica Hypol. Weym. Berl. Ent. Zschr. 44, p. 311. * vertieilla Nap. Hew. Exot. Butt. 5. *

vestilla Pter. Hew. Exot. Butt. 1. * vicina Leuc. Salv. Ann. Nat. Hist. (4) 4, p. 165. vietorina Leuc. Gaér. Règn. Anim. Ins. p. 470. villula Call. Hew. Exot. Butt. 2. * viola Cer. Hsch. Berl. Ent. Zschr. 50, p. 149. virginian Hypose. Hew. Exot. Butt. 1. * virginian Hypose. Hew. Exot. Butt. 1. * virina Leuc. Hsch. Seitz, Macrolep. 5, p. 147. virschovi Sais Dew. Mitth. Münch. Ent. Ver. 1, p. 87.* visenda Mech. Bitr. Cist. Entonol. 2, p. 150. visina Dirc. Hsch. Berl. Ent. Zsch. 48, p. 178. * vuleana Ith. Hsch. Seitz, Macrolep. 5, p. 142.

xanthina Scada Bat. Ent. Month. Mag. 3, p. 52. xanthippus Dan. Fldr. Wien. Ent. Mon. 4, p. 100. xantho Dirc. Fldr. Wien. Ent. Mon. 4, p. 101. xanthophane Dirc. Hp/fr. Stett. Zg. 1874, p. 338. xanthostola Cer. Bat. Trans. Linn. Soc. Lond. 23, p. 525. xanthone Nap. Bal. Trans. Linn. Soc. Lond. 23, p. 537. xenophis Hypol. Hsch. Seitz, Macrolep. 5, p. 160. xenos Ith. Bat. Ent. Month. Mag. 3, p. 50.

yungava Pter. Hsch. Berl. Ent. Zschr. 50, p. 175.

Exot. Butt. 2. zabina Pter. Hew.

- zabina Pter. Hew. Exot. Butt. 2. *
 zalnunna Dism. Hew. Exot. Butt. 4. *
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 zarapeha Leuc. Hew. Exot. Butt. 4. *
 zavaletta Dism. Hew. Exot. Butt. 1. *
 zelica Leuc. Hew. Exot. Butt. 1. *
 zelica Leuc. Hew. Exot. Butt. 1. *
 zelina Scada Hew. Exot. Butt. 1. *
 zerlina Pter, Hew. Exot. Butt. 1. *
 zerlina Pter, Hew. Exot. Butt. 1. *
 zerlina Scada Hew. Exot. Butt. 1. *
 zerlina Scada Hew. Exot. Butt. 1. *
 zerlina Scada Hew. Exot. Butt. 1. *
 zitella Sis Hew. Exot. Butt. 4. *
 zurippa Nap. Hew. Exot. Butt. 5. *
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Pars II. Fauna americana 1.



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ITHOMIA-LEUCOTHYRIS





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LEUCOTHYRIS-PTERONYMIA





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