

[FROM THE TRANS. ENT. SOC., VOL. V., N.S., PART VIII.]

XXIV. Contributions to an Fauna Fauna of the Amazon Valley. (Continued from page 278.) By H. W. HARRIS, Esq., Cor. Memb. Ent. Soc.

[Read November 29th, 1855.]

Group 2. *P. Chloridamus*, and allies.

The preceding group is continued, through *P. Medus* and *Pictarius*, Dahl,\* with the series of five species of which *P. Inconcolor*, Dbl., may be considered the type, but which has no representative in the equatorial low lands of America. Next in this might naturally be ranged the group to which *P. Polypus* and *Thous* belong; but I prefer to follow the very evident line of affinity which connects *Pictarius* of the preceding, to *Chloridamus* of the present group. Of the five species, viz.: *P. Chloridamus*, Dbl.; *P. Hypericæ*, Hbn.; *P. Phœn.*, Dbl.; *P. Albus*, Drap. and *P. Pennsylv.*, Harris, which belong here, the last mentioned is the only one found on the banks of the Amazon. The group is remarkable for the tendency to elongation in the wings, which reaches an extreme point in *P. Pennsylv.*; where the lacinæ of a *Pyralis* glass plate is that of a *Heliopsis*. It differs greatly in the antennæ from the species of the preceding group; those organs being short, with a strong abrupt club bent outwards, as in the species of the typical *Pictarius* group. The abdominal field of the hind wings is very slight and curved downwards.

*P. Pennsylv.*, Harris. Trans. Ent. Soc. 1852, pl. 6, f. 2.

On the Amazon I have seen this species only at Villa Nova and at Ega. The species of *Heliopsis* which it most closely resembles is the *H. Clypea*; it has also something of the sailing, circling flight of the *Heliopsis*, but in other respects shows very different habits. It is never seen in the shades of the woods, to which the *Heliopsis* are confined; but is observed either about the summits of high trees, or settled on the muddy margins of the rivers and lakes in company with species of the preceding group.

Group 3. *P. Ilar*, and allies.

*P. Erythra*, Harris, of New Granada, connects the preceding naturally with the present group. Here commences the style of coloration, viz.: black ground colour, with crimson and white or green bars and spots, which characterizes the main body of Neo-Tropical *Pyralis*. The species of the present group, however, differ from those of the chief group of these insects in their antennæ and habits. The antennæ are here generally short, and rather abruptly clavate, whilst always long and slender in the group mentioned. Their flight is much more powerful, and, instead of being confined to the shades of the forest, they frequent the sunny skirts of the woods, and are frequently found with other strong-flying *Pyralis* at the usual margins of the rivers. The abdominal field in the hind wing of the males, also, is very different from that of the group alluded to, being scarcely perceptible, whilst always very largely developed in the insects composing the other group. The chief species are, *Ilar*, F.; *Aurantiæ*, Fajon; *Pictaria*, Donthedy; *Harmonia*, Dahl.; *Leptus*, Harris, and *Nipponis*, Cress.\* The two last-mentioned differ greatly from the others in the antennæ, whilst agreeing with these well in all other respects.

\* Mr. Housson has lately acquired from Mexico an incomparably beautiful new species of this group, which I hope to see shortly figure and describe.

- P. Arisarathes* ..... ♀, Esper, Anal. Schmetz. t. 14, f. 2 (*Arisarathes*).  
 Gray, Cat. Lep. B. M. p. 60, pl. 11, f. 2 (as *Cyrenus* ♀).  
 ♂, Boisd. Sp. Gen. No. 104 (as *Ita*, ♀).  
 Gray, Cat. Lep. B. M. p. 61 (*Arisarathes* ♂).  
 ♂ and ♀, Krichson in Schomb. Reise in Brit. Guiana, p. 333 (*Arisarathes* ♂ and ♀).  
 Local var. *Cyrenus* ..... ♂, Gray, Cat. B. M. p. 60, pl. 7, f. 1 (*Cyrenus* ♂).  
 Local var. *Grayi* ..... ♂ Lucas, Rev. et Mag. Zool. 1852, p. 124 (*Grayi*).  
 Local var. *Evagoras* .. ♂ and ♀, Gray, Cat. B. M. p. 61, pl. 2, f. 2 and 4 (*Evagoras* ♂ and ♀).

The figure of Esper does not show the pointed lobe in the middle of the margin of the hind wing, which, indeed, is deficient in some individuals; whereas it represents very nearly the insect figured by Gray as *Cyrenus* ♀. The ♂ was referred by Boisduval to the *Ita* of Fabric, but it is easy to see from the description of Fabric, where he gives the fore wing beneath as immaculate, and the hind wing as having four red spots at the base, that he had in view a quite different species. The figure in Jones's drawings (of which Mr. Westwood kindly showed me a tracing) agrees with the Fabrician description, which, indeed, represents an insect that I have not yet seen in any collection. The number of the red spots at the base of the wings beneath in this group is an important specific character. *P. Arisarathes*, with all its varieties and named local sub-species, has always two red spots at the base of each wing, with sometimes an indication of a third in the hind wing at the base. The species is one of the most variable in its coloration, and partly so in its wing-outline; the varieties are generally, however, local, but the individuals composing them are not counted enough, nor are the characters sufficiently well defined, to induce me to treat them as independent sub-species. The individuals of the type vary amongst themselves in the same locality. The ♂, as pointed out by Linnaeus, has a triangular, dusky cream-coloured spot, variable in size, on the fore wing, proceeding from about the middle of the hind margin and extending obliquely outwards towards the middle of the wing. The apex of the spot sometimes terminates at the base, sometimes extends to the third median nervule. The red macular belt of the hind wing varies very much in breadth and in the number of spots of which it is composed. The typical form of *Arisarathes* I obtained chiefly at Park, where some of the local varieties above cited occur; it is also found in English, Dutch and French Guiana. It is a rare species, and flies with great rapidity in sunny places about the borders of plantations.

*Var. Cyrenus*, Gray, ♂. This is an extreme variety of the ♂. It occurs on the Upper Amazon. Here, the pale spot of the fore wing, rather whiter than in the type, is removed to near the outer margin of the wing and is prolonged into a belt. Other varieties are before me, showing the belt varying nearer to the middle of the hind margin; these intermediate forms occur at Ega, and lower down the coast at Villa Nova. Examples agreeing with the ♂ but none with the ♀ of the true *Arisarathes* have been found on the Upper

## An Amazon Form of the Amazon Flycatcher.

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**Amazon.** I found examples of a ♀ in company with *Cyanus*, at Ega, destitute of white spot on the fore wing, which I consider the ♀ of *Cyanus*. I add a description of it.—*Cyanus* ♀. Somewhat smaller than ♂ *Aristocles*. Wings black, apical half of fore wing much clearer, fuscous. Fore wing, above, immixt rufous; beneath, with two deep-red spots at the base. Hindwing, above, with a faint encephalid of five elongate red spots, of which the anal one is prominent, the central one sometimes extending into the cell; beneath, the same spots paler in colour, and with two deep-red spots at the base. Host as in *P. Arisostes*. Two specimens taken at Ega.

**Var. Gayi, Lucas ♀.** Also an extreme var. of the ♀. I obtained a single example at Ega, which I have compared with the typical specimen of Gayi in the Collection of the Jardin des Plantes, at Paris. The spot of the fore wing, darker and clearer cream-coloured than in *Aristocles*, is large and sub-quadrate in form, and attached nearer to the base of the wing on the hind margin. The red muscular lobe of the hind wing is colored in two spots, viz. : one, the usual two-spot at the anal angle, and another a little removed from it. The rest as in the *Aristocles* ♀. The Parisian specimen was obtained from Cayana, in the south of Para, doubtless from the humid forests of the Upper Uaupak near there, which are continuous with those of the Teffé, where mine was captured.

**Var. Inopson, Wetters, Gray, ♂ and ♀.** This form was described from specimens taken in Venezuela by Dyson, having been first referred erroneously by Doubleday to the *Pin* of Fabricius. The ♂ differs in an essential point from the ♂ of the *Aristocles* type. The ♀ is rather more distinct, the spot of the fore wings being dusky cream-coloured instead of white. The character alluded to by the red lobe of the hind wing extending into the cell, as given in Gray's *Species*, is not of specific importance, as it occurs in individuals of several other species of this and allied groups. Males agreeing with *Inopson* have been taken on the Rio Negro in the Amazon region, and I found the form also at Ega. It is a curious fact, that most of these ♀ *Papilionæ* which, towards the mouth of the Amazon, have a large white spot on the fore wing, show a tendency to lose it in localities higher up the river, or in Guiana, as we shall see presently in *P. Hippson* and *P. Cyanus*. In some species, indeed, the white spot changes in some of the individuals to a dusky yellowish tint, as well as disappearing altogether in others. In the present species we see the ♀ has lost the spot in ♀ *Cyanus*, and has changed the colour of it in ♀ *Inopson*. The same takes place in *P. Fictus* of Gray, as will be seen in looking of that species.

*P. Hippson* ..... ♂, *Cram.* 29 E. ♂ (*Hippson*).

♀, *B.* 883 A. B. (*Aronis*).

Local var. *Paracana*, nob. ♂ and ♀, *Gray Cat. B. M.* p. 28, pl. 14, f. 2 (*Hippson*, var. h. ♀).

*P. Hippson* occurs in the Amazon region only as a local variety of the *Sarothamnus* type, as figured by *Cramer*. But the variety is shown distinctly only in the female sex, as in other species of *Papilio*. The grey and white spots of the fore wing of the ♂ differs much in examples from one and the same locality. The ♀ of the *Sarothamnus* type, so far as we know, has spotless fore wings; in the *Paracana* it has always a large rounded white spot in the centre. It is only found in the neighbourhood of Para, where it frequents the borders of the luxuriant, humid forest in the N.E. of the city. It flies very rapidly, but is not very difficult of capture on account of the lucidness with which it allows itself to be approached when settled on foliage. It is a strikingly handsome species, distinguished from all its congeners by its peculiarly straight antennæ, and is interesting as having no other species nearly allied to it, and being confined in its range to Guiana and the Delta of the Amazon.

Group 4. *P. Archibanksi*, and allies.

This group approximates in the character of the shabiness of the antennæ to the great *Acanis* group of Tropical American Psychodæ, and indeed might be included therein, did it not contain a number of species of peculiar habits (e. g., *P. Phœnax*, Ill.; *P. Phœnix*, Ill.; *P. Thaumaspis*, Hbst., &c.), which would not harmonize well with the other species. They have not, either, the simple oblongated wing-field so characteristic of the group mentioned. They are allied, in this and other respects, to *P. Terpsino* of the *Thaum* group. They are not true forest hoppers, like the *Acanis* genus of species; they frequent merely the skirts of the woods and congregate on the wood margins of water. *Archibanksi*, and some of its varieties, are the only forms found on the banks of the Amazon.

*P. Archibanksi* . . . . . Esper, *Anal. Schœnelt*, t. 13, f. 1, 2.  
Cram. 378<sup>a</sup>-b, B, C, D, (as *Archibanksi*, Lin.).

Local var. *Indiana* . . . Doubld. *Ann. Nat. Hist.* xvii.  
(1816), p. 374.  
Gray, *Cat. B. M.* p. 64, pl. 5, f. 1.

This is a very variable species, at least in some localities. On comparing a series of examples of the allied form *Idæus*, Fabr., from different localities with the present, I think it would be difficult to find characters constant enough to separate them as two species; one form or other of the two occurs over a wide extent of country, from Rio Grande in 22° S. lat. to Mexico, in 32° N. lat. The varieties found in the Amazon region, however, I will refer to the *Archibanksi*, taking Cramer's figures as the type. In the typical form both sexes have a large, rounded, dull-white spot on the fore wing, and a broad belt of four elongate red spots on the hind wing; the distensions of the hind wing are of equal size, and the three marginal crosses nearest the angle are fringed with rufous colour, the rest being bordered with white. Very few of the examples found by me on the Upper and Lower Amazon agree with the type in these characters; but the individuals vary in one and the same locality. The following are some of the varieties.

Var. a. Marginal crosses all bordered narrowly with white, that at the anal angle only being spotted with rufous colour. White spot of fore wing reduced in size, being enclosed between the post-median nervule and the first median nervule. Santarém, Lower Amazon.

Var. b. g. Hind wing very much produced towards the anal angle and the whole outer margin scarcely produced. Marginal crosses all bordered with white. Eggs, in company with the type.

Var. c. *Idæus*, Ill. g. The example before me is only an approximation to the *Idæus*, Ill. The fore wing there is immolated. The hind wing has the distension at the third median nervule much more produced than the others. The crosses are all edged with white. The spot left of hind wing is similar to that of the type, but much smaller. Beneath, the fore wing has a large dusky-white spot, half way between the median nervule and the hind angle, divided by the first and second median nervules; the hind wing has, in the place of the red belt of the upper surface, a series of four spots, of which the two central ones are large, and pinkish-white in colour, the outer ones very small, of some colour; the inner one rounded and rounded; all four are accompanied on the upper side by a small rose-red spot. There is also a row of three similar red spots between them and the costal edge of the wing. *P. Indiana* differs a little from this variety, but only as a further divergence from the type; it was found in Bolivia. My specimen I took at Iquitos, in company with the type, *Archibanksi*. *P. Indiana* occurs in the south of Brazil, under numerous forms seen in *Howlandia* and *Marão*, some of which have not yet been described either as species or varieties (e. g., *P. Parana*, Hbst., of the French collection). I bred *P. Archibanksi* from

larva feeding on the orange tree at Santarem; the larva is figured by Stål, pl. 1, f. 2.

Group 5. *P. Ewersi*, and allies.

This, the most numerous group of American Psychodæ, is distinguished from all the others by several important characters. The antennæ are very long and slender; gradually thickened and strongly curved upwards, at the tip; the abdominal fold of the hind wings is very strongly developed, soft in texture and turned upwards, enclosing generally a mass of silky, down-like pubescence. The style of coloration is very similar throughout the whole of the species; viz., black ground, with white or green spots on the fore wing, and crimson or yellow bell-shaped spots on the hind wing. Its habits they all agree in being exclusively frequenters of the shades of the forest. They are particularly the creatures of those vast, varied and humid forests which clothe the wide-spreading equatorial plains and every swelling eminence of tropical America, from the river Plata (about 35° S. lat.) to Mexico (about 16° or 25° N. lat.). Southern and Central Brazil yield five species, Colombia with Para about thirteen, Central America and Mexico about five; whilst the Amazon valley with Guiana yield about twenty-two, most of which are exclusively found there. I believe no species has hitherto been found in the West Indian Islands (Trinidad, which is supposed to yield one, must be considered merely a detached portion of the main land); and of the western Cuban species of Pappe, enumerated by Loew in Ogger's "Hannoversche Fauna," no one belongs to this group. In the forests of the Americas they abound both in species and individuals, each of the subdivisions of the country yielding its peculiar species and local varieties. They are of rather slow flight, and are generally seen threading their way amongst the lower trees and bushes in the more humid and luxuriant parts of the forest, being most abundant in the periods of the year between the dry and the wet seasons. Sometimes they resort in considerable numbers, attracted by the rufousness of the flowers of climbing plants. The females always fly near the ground, and slower than the males; depositing their eggs, in passing, on the underside of the leaves, one on a leaf of low plants. They are not related closely to any other group of Psychodæ either of North America, or any part of the Old World; their nearest alliance is through the South Brazilian *P. Dardanus*, with the *Aperis* group, which is found nowhere but in the south of Brazil, and, although of very different habits, shows in its coloration and in the ample abdominal fold of the males a proximate relation to the present. The group is essentially American, showing, like the *Pharyngina* Mosquito, the internal Eristata, the *Tocosa*, the *Cuvata*, &c. in the mammals and birds, the features of South American vegetation, its distinctness and its adaptation to a humid country of enduring continuance and vast extent. The sexes differ very much in colour, and the females are generally more subject to vary than the males; in consequence, mistakes have been made by almost all the authors who have written upon them, and the nomenclature is in a very confused condition. The color of the fringe in the margin of the wing-membrane is an important character and very useful in the identification of the species; I shall class the species according to it.

Section 1. Fringe of the wings white or yellowish.

- P. Sarcotis* . . . . . ♂, *Cuv.* 211 F. G. and authors.  
 ♀, " *Id.* 217 C. D. (as *P. Tullæ*).  
 ♀, Gray, *Cat. B. M.*, p. 58, pl. 3, f. 2 (as  
*P. Cursoni* ♀).

The male of this beautiful species does not vary in the slightest throughout the country which I explored, through 22 degrees of longitude, from Para to Tabatinga; being always conformable to the Sarcotis type as figured by Coquerel; but 5 degrees farther west, on the Negro, near the head of the Andes, it begins to vary; specimens from there showing the commencement of an elongate crimson spot, near the abscissed edge of the hind wing. These are found in conjunction with

a still further deviation from the type, viz., the *P. Chelivense*, Giesb. (Gill. An. King, pl. 28, f. 1, 2; Göttingen, Lucas, *Voy. de l'Est. Esp.*, pl. 9, f. 4), and also with the typical *Severini*. *P. Chelivense* in the valleys of the Andes near Huancayo, becomes the prevailing form; indeed, I have seen large numbers of it in collections from there, unaccompanied by a single individual of the type. Another variety, differing from *Chelivense*, occurs farther northward in Honduras, the ♂ of which only has been figured (Lucas, *ibid.*, loc. cit.).\* The female varies a little in the breadth of the crimson belt of the hind-wing, in the presence or absence of a spot between the third median nerve and the lower discoidal nervure, and of a similar spot between the upper discoidal and the costal nervures of the hind-wing. The cream-colored spot of the fore wing also varies a little in size and shape but not in position. In the Honduras var. Lucas, the spot undergoes a more considerable alteration (fig. loc. cit.). *P. Severini* is the boldest form of the group; but I have never seen him out of the forest.

- P. Fortmanni* . . . . . ♂ Cass. 211, A. B.  
 Var. ♀ Gray, Cat. B. M. p. 48, pl. 11, f. 4  
 (as *P. Dierrovi*).  
 Var. ♀ (Bdv.) Lucas, Rev. and Mag. Zool.  
 1852, p. 482 (as *P. Phoenix*).  
 Var. ♀ Gray, Cat. B. M. p. 48, pl. 8, f. 6  
 (as *P. Cipres*).  
 Var. ♀ Bdv. Sp. Gen. Pap. No. 117 (as  
*Carhu*).

Local Var. *Catona*, Gray, ♂ Gray, Cat. B. M. p. 58, pl. 10<sup>a</sup>, f. 4.

If we except the strongly marked variety *Catona*, the ♂ of this is subject to no great variation from Peru to the Patagonian frontier. The so-called var. fig. C. of Casser has not been found on the Amazon. The true *Fortmanni* varies only in the presence or absence of a white spot in the green patch of the fore wing, and of a fourth epauletate or lunular spot in the hind wing. But the ♀ varies so much that it is difficult to find two individuals alike. What I consider to be the typical or most usual form of the sex has not been described; but it agrees with the figure of *P. Dierrovi* of Gray, except that the crimson band is not subopaque. The white spot of the fore wing varies from the large, irregular patch of the var. *Catona* to the small quadrate spot of the var. *Cipres*. The crimson belt of the hind wing, in some examples sub-epauletate, is sometimes narrower sometimes broader; sometimes remains of five spots with indications of a sixth, but generally of only four. The declivities of the hind wing, also, vary very much in size, sharpness, and prominence, the central one being sometimes longer than the others. The true *Fortmanni* appears to be confined to Guiana and the Amazon region. At Saricoma it shows a strongly marked var. (fig. C. Cass. t. 211), which extends into Colombia, and in *P. Tolsonii*, Bdv. Cat. Towards the frontier of Peru in the Amazon region, it shows a variety of quite a different nature in *Tolsonii*, the *Catona* of Gray. In the Andean valleys of New Granada it is represented (or perhaps becomes changed to) the *P. Pyrochloa*, Doubledt. (Gray, Cat. pl. 9, f. 2), but in some part of the same country it shows a strong resemblance to its type, as in *P. Phoenix*, (Kollar, *Beit. N. G.* t. 1, f. 5, 6). In the *P. Severini* and in several undescribed varieties from New Granada, there appears to be a transition between the forms resembling *Fortmanni* and those resembling *Proteso*, while

\* There is a ♂ example in the B. M. Coll. from Honduras, which seems intermediate between *P. Severini* and *P. Chelivense*; it has a narrow crimson spot on the hind wing between the subterminal margin and the first median nervule. It may be considered the ♂ of Lucas. Examples occur from New Granada and the Napo. The green spot of the fore wing is as in *P. Severini*.

at Pará, *Peromyscus* keeps itself perfectly distinct from, although existing in the same forest with the form there representing *P. Proximus*, viz. the *P. Hirsutus*, Gray. *Peromyscus* is found in the humid forests near Pará generally in company with *P. Leucurus*, flying slowly: on the Upper Amazon it delights to settle on the moist margins of the rivulets which there flow through every ravine in the forest, where in the deepest shade many of the most beautiful beetle butterflies love to congregate, as *P. Coarctatus*, *Parvus*, *Larvatus*, *Eschschii*, *Parvus* and many others.

Local var. *Coarctatus*, Gray, loc. cit. This form has a very different aspect from the type, on account of the peculiar colour of the spot of the fore wing, which is yellowish-ochraceous instead of green. In the example before me the ocellaceous crimson spots of the hind wing are only two in number, and, beneath, are plain in colour; the fringe also is yellowish. Had it occurred in numbers in its locality, to the exclusion of the type, I should have treated it as an independent or head form of its group. It is found on the Upper Amazon only, at Pará and St. Paulo, in company with the type but much rarer. I have an example of a ♂ from Pará, which I consider to be the ♀ of *Coarctatus*; I add a diagnosis of it. *P. Coarctatus* ♀. Size and form of *P. Hirsutus*, dentations of the hind wing much less acute. Fore wing immovably above and beneath, and of a fuscous colour. Hind wing with a sub-apical crimson belt, similar in form to that of *P. Hirsutus*, but wanting the outermost spot: the belt beneath pale rose-colour.

*P. Hirsutus* ♂, Gray, Cat. B. M. p. 55, pl. 10, f. 3.

♀ ib. p. 55, pl. 3, f. 3 (as *Hirsutus* ♀).

†♀ ib. p. 55, pl. 10, f. 6 (as *Aglyptus* ♀).

♀ ib. p. 55, pl. 10\*, f. 7 (as *Filiculus*).

♀ ib. p. 49 (as *Cyathotus*).

The ♂ is tolerably constant to the type as figured by Gray. It varies, as do all the species of the group, in the greater or less prominence of the dentations of the hind wing; the ocellaceous crimson macular belt of the hind wing varies in breadth, and the number of spots of which it is composed varies from three to five. In some individuals the belt is in the same position as it is in examples of the *P. Proximus* of Rio Janeiro. The ♀ varies more than the ♂. The white spot of the fore wing varies in size, but it is always of a clear white. The crimson belt of the hind wing consists of five or six spots (the anal one sometimes geminate) rather widely separated; sub-anal in shape, varying in size, the second and third always the largest, the 5th often large and rounded; it crosses the wing in the same position to the macular belt of the ♂. The range of the species is restricted to Pará. It will probably be found also in the other northern provinces of Brazil, and must be looked upon as the representative in those regions of the *P. Proximus* of Rio Janeiro. It fits in the same forest as its ally *P. Peromyscus*, but prefers the dryer areas, where the soil is light and sandy. *Peromyscus* being found more in the lower and moister districts. They keep themselves perfectly distinct, and an instance of hybridity has come under my notice. The forms of this group resembling *Proximus* are numerous, and taken together have a wide range. At Coarctatus, on the Plata, beyond the tropics, a magnificent form occurs, *P. Orthopterus*, Latreil; in Bolivia and in the forests of Peru, east of the Andes, *P. Hirsutus*, Gray (Cat. B. M. pl. 3, f. 3). In Venezuela there is a beautiful representative, viz. *P. Evaharion*, Latreil (Gray, 10\*, f. 3 and 4); in New Granada, *P. Scrupis*, Latreil (Op. Gray, t. 1 B. f. 2), which comes nearer our *P. Hirsutus*. In Honduras there is *P. Iphigeneus*, F. (Gray, pl. 3, f. 1 and 2), and in Mexico, *P. Panama*, Gray (pl. 10, f. 4), of which *P. Hirsutus*, Edw. MSS., is probably the ♂. Lastly, in the east, probably in the Island of Trinidad, there occurs *P. Cyathotus*, Edw. (Gray, pl. 10, f. 8). No representative has as yet been found in Guiana,\* or

\* Since writing the above I have acquired a specimen of a *Papilio* from Demerara, which resembles *P. Tobiasus* (Cram. 251 f.), but also approaches in many points *P. Hirsutus* of Pará, and *P. Evaharion* of Venezuela. I add a brief de-

in any part of the Amazon region except the neighbourhood of Para. In its habits it resembles *P. Peruvianus*, and is never seen out of the shade of the forest.

*P. Aeneus* ♂, Lin. Kassel, Dec. 18, 1851, ♂ ♀ (*Alanus*).  
 ♀, Gray, Cat. B. M., (as *Aeneus*, 18. ♀).  
 ♀, Hübner, Nouvel. Ex. n. 121 (as *Mercator*).

This species offers no possible variation in either sex. It is, at the same time, of very limited range, having been found only in Guiana and the southern part of the Delta of the Amazon, at Para. In the latter district it is always found in company with *P. Peruvianus*.

*P. Rufus* ♂, Howitt, Tr. Ent. Soc. 1853, p. 97, pl. 18, f. 2.  
 ♀, Gray, Cat. B. M., pl. 10, f. 7.

From Para to the mouth of the Rio Negro within *P. Aeneus* near any form resembling it occurs; but in the Upper Amazon, at Ega, there is found the present species, apparently very distinct from *Aeneus*; but from the similarity of its habits, and from the fact that in all its marks of difference analogous ones are offered by other local forms, which forms having these less in degree are considered as mere varieties of their type, it was inclined to consider it as a geographical variety of that species. At Para, *P. Aeneus* flies in company with *P. Peruvianus*; in the same way *P. Rufus* has this species for companion at Ega; but *Peruvianus* has only changed in some individuals (*P. Catox*), whilst *Rufus* has totally varied from its type. *P. Catox*, however, in the points where it differs from *Peruvianus*, differs in the same direction in which *P. Rufus* does from *P. Aeneus*; viz. the green spot of the fore wing changes to ochraceous, and the red spot of hind wing beneath to yellow; the contrast in colour, however, being more strongly marked in the one than in the other case. The ♀ has changed from the ♀ *Aeneus* far more than has the same sex in *Catox* from its type; but only in the coloration of yellow for crimson on the hind wings, a change of colour which we shall see has a tendency to occur in other species (*P. Fictus*, Gray). Some more should also be taken of the greater isolation of *P. Rufus* in its geographical relations to its type, and also of the opposite fact, which a close study of species in natural history will reveal, that species differ increasingly amongst each other in their susceptibility of change. Susceptibility of change, power of adaptation with or without change to new local circumstances, are qualities or characters of species, just as much as bodily structure or passive instincts. The subject of "representative species" was constantly before my attention during my travels. After becoming thoroughly familiar with the productions of one region during several years' residence, I have at different times, removed to another several hundred miles distant, and have been then obliged to notice the changes of appearance that many of my old friends had put on; some more, others less; whilst some had assumed quite the form of new and distinct species. It is not, however, all the allied species thus representing each other that can be considered in the light of having varied the one from the other; there are cases in which two such

specimens of a *P. Phosphorus*, vols. ♂. Marked *P. Harcourt*, the apicalmost crimson venous part of the hind wing consisting of four spots (with a fifth very minute), placed exactly as in examples of *Harcourt*; fore wing with a broad, short, triangular grey-green spot in the middle of its hind margin, the spot newly reaching the second median nervule, and having two minute white spots in it, one behind the second, the other behind the first median nervule. *Demerara*. This insect is especially interesting as serving to connect still closer the forms between *P. Peruvianus* and *P. Fictus*. If the processes of connecting links obliges us to link two species into one, these two forms ought to be considered as one species, that is, one of them as a local modification of the other; how is it then that one of the local varieties, *Harcourt*, presents the most distinct analogy of a true species, its analogy with *Peruvianus* without amalgamating with it?

species occur together over a wide district on the frontiers of their respective regions without amalgamating or showing any intermediate forms. In some cases the differences between the two are much more strongly marked than in others; and then we must seek for other causes of their origin than the operation of local conditions on one and the same species in distant points of its present area of distribution.

*P. Triopa*, Godt. Enyc. Mith. ix, p. 33, No. 33.

This is another species of confined range. It occurs only in Guiana, at Park and on the Lower Amazon. I found it chiefly at Park and Okydes. It has been generally placed in classifications far away from the present group, but an examination of its antennae and the abdominal field of the ♂ will show at once that this is its right position. Indeed, this led the following, I look upon as the culmination of the type of the group. In a group of the *Psychis* genus, where the effects of a confined forest habitat are seen in many points of structure, as well as in the established powers of flight, these two species show these characteristics to a greater extent than any of their congeners. The female flies near the ground and very slowly, but the male takes a higher and rather bolder flight.

*P. Chelonia*, Hewitt. Tr. Ent. Soc. 1852, pl. 6, f. 1, ♀.

The ♂ has not been figured. It agrees in colour and markings with the ♀. It is found exclusively on the Upper Amazon, where no example of *P. Triopa* has occurred, and I consider it a geographical modification or subspecies of the latter, in the same way as *P. Soliva* is of *P. Euxoa*.

*P. Oryza* ♂, Hewitt. Tr. Ent. Soc. 1852, p. 24, pl. 3, f. 2.

This most beautiful and distinct species has the same glossy steel-black ground colour of the wings as *P. Panthous*, Cr. The latter, however, has a rose-coloured fringe, while the example of *P. Oryza* has, although it is scarce and obscure, a white fringe. It is, therefore, a species which had no near ally in any part of tropical America. I found only one individual during a four years' stay in the district, at Ega, on the slopes of a beautiful ravine in the forest, flying in company with *P. Sarcia* and *P. Lyander*.

Section 2. Fringe of the wings re-coloured.

*P. Aglyps* ♂, Gray, Cat. B. M. p. 55, pl. 10, f. 3, ♂.

The ♀ would be similar to the fig. 5, pl. 10, of Gray, if the fringe were re-coloured instead of white; but I have not seen any ♀ which I could refer to this species. The ♂ is nearly allied to *P. Euxina*, Cr. (t. 29 f.), and to *P. Panthous*, Cr. (228 C. D.); all three belonging to the mass of neo-tropical *Psychis*. *Aglyps* was taken at Park; I have only seen two examples of it, one in the B. M. Collection, and one in my own.

*P. Lyander* . . . . . ♂, Cram. t. 39 C. D. (*Lyander*).

- *Eryman*, Godt. and Reischner.
- Gray, Cat. B. M. p. 55, pl. 8, f. 7 (as ♂ of *Brianna*, Hübn., the fringe white, by error of collector).
- ♀, Cram. 386 C. D. (as *Arctos*).
- Hübn. Samml. (as *Arctos*).
- Deid. Sp. Gen. Pap. No. 118, part (as ♀ of *Panthous*).
- Godt. Enyc. ix. Pap. No. 31 (as *Arctos*, l.).

- P. Eysander* ..... ♀, Hübn. Samml. (as *Pezomachus*, corrected in his Vera, in *Reichenow*).  
 — Gray, Cat. B. M. pl. 8, f. 8 (as ♀ of *Reichenow*, Hübn.).
- Local var. *Parasita*. Gray, ♂, Gray, Cat. B. M. p. 51, pl. 8, f. 3 (as *Parasita* ♂, fringe white, by error of colourist).  
 ♀, Gray, Cat. B. M. pl. 8, f. 4 (as *Parasita* ♀, fringe white, by error).  
 — Gray, *ibid.*, p. 57 (as *Saxaria*), and pl. 10, f. 1 (as *Saxaria*, var.).

The ♀ of this species, like those of *Arborea*, *Hesperis*, *Parasita* and others, varies in the white spot of the fore wing, which is sometimes wanting altogether. This, together with its proper name being unknown, has given rise to much confusion in the synonymy. The varieties of the ♀, however, are nearly constant according to locality. The *Saxaria* form has generally an obscure small white spot; at Capana a great many have the same spot (*Feldia des Plantes*, as *Pezomachus* ♀), but there occur others with a larger spot divided in two by the 2nd median nervule (Hübner, Sp. Gen. p. 200). On the Upper Amazon every ♀, without exception, is spotless; at Yala Sierra, on the Lower Amazon, most of them are spotless, but there occur a few with a slight trace of white spot. At Paik and on the Taramana, where the species abounds, every individual has a very large white spot, almost always entering the cell. As this male in the larva locality shows generally a broader and brighter green spot of the fore wing, it is here treated as a local subspecies of *Eysander*, and may be considered as a variety constant and fixed form. The spotless, or small spot ♀, has generally been considered as the ♀ of *Pezomachus*. *Pezomachus*, however, does not occur on the Amazon. I have seen examples of both sexes from *Itanema*, the ♀ resembling closely the ♀, and can very readily be distinguished from *Arborea* by the shape of the red spots of the hind wing. The *Arborea* of Cramer is decidedly not the ♀ of *Pezomachus*. *Eysander* is found very abundantly at Yala and St. Paulo on the Upper, and at Yala Sierra on the Lower, Amazon. *Parasita* is confined exclusively to the district of Paik. They prefer the most humid parts of the forest, and fly busily. *Parasita* especially delights in the swampy palm groves which cluster the underbrush along at the mouth of the Taramana.

*P. Eubates*, ♂, Hübn. Samml.

♀, ib. (as *Eubates*).

Var. ♀! Gray, Cat. p. 55, pl. 10<sup>b</sup>, f. 1 (as *Spartacus*, Ed.)

This species appears to occur in no other country except the lower part of the Amazon. It is the commonest of all the species of its group at Paik, and occurs at Santarem, on the northern shore of the Lower Amazon, but less abundantly. On the northern shore, at Nepe and Hara, it is represented by *P. Eubates*. At Capana, however, there occurs a form intermediate between the two, as will be mentioned presently. *Eubates* inhabits the drier districts in the forest, and flies in company with *P. Saxaria*. It delights to suck on flowers, especially the profuse spikes of flowers of *Cambourouci* plants, which hang from the overhanging trees in the narrow alleys of the forest near Paik.

*P. Egristoides* ♂, Gray, Cat. B. M. p. 52, pl. 8, f. 5.

The following is a diagnosis of the ♀, from a unique specimen in my collection (as *P. Egristoides* ♀). Similar to *Eubates* ♀. Fore wing much more pointed, having in its centre a rounded, dirty white spot, dusky round its edge, and divided by the second median nervule. Hind wing with a crimson belt, much broader

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and less distinctly marbled than *P. Eubates*, composed of six spots, of which two smaller, and; the next three much elongated, like the corresponding ones in the ♀, and the sixth small, triangular. The rest as in *P. Eubates* ♀. This beautiful form, apparently so distinct, took the place of *Eubates* on the north shore of the Amazon, but it does not pass apparently the Rio Negro to the west. It is evidently a local sub-species of *Eubates*. At Cayenne there occurs a form, apparently intermediate between the two; but the individuals there vary considerably amongst themselves, like species in process of transition. I add a description of it in a note, from two examples which I obtained lately in Para.\*

*P. Eubates* ♀, Esper, Anal. Schneit. 4, 13, t. 3, p.

Cram. t. 279 A. D. (as *Eucen*, Lin. ♀).

♀, Gray, Cat. B. M. p. 31, pl. 9, f. 8 (as *Eubates*, ♀).

This species occurs in Guiana and on the Lower Amazon. At Para, where *Eubates* is so common, it is not found at all, but is extremely plentiful on the Tocantins. It occurs at St. Paulo, near Para, as a well-marked local sub-species. Its habits are those of *Eubates*; it frequents rather the high and dry parts of the forest, but yet those where there is an alluvial soil, especially delighting in the more groves, and the wildernesses of second growth forest usually found in their vicinity.

*P. Olyceus*, n. sp.

♂. Size, shape and ground colour of wings as in *P. Eubates* ♀. Fore wing with a large sub-triangular, greyish-green spot, nearly touching the hind margin about the middle, its apex reaching the second median nerve. Hind wing with a large crimson palmar spot as in *P. Eubates* ♀. Fore wing spotted. Hind wing with a belt of pale crimson spots, six in number, extending in a wavy line across the wing, a little behind the vein; the spots are nearly equal in size, similar in length to those of *Eubates* ♀, but much more widely separated by the intervening nervures. This sub-species or local form of *P. Eubates* is abundant at the village of St. Paulo de Olivença, near the frontier of Peru. I have also seen an example of it from Bogota, in the Bogota Collection at Gleditsch. At St. Paulo it is constant to the characters given above. The most westerly point of the range of the typical *Eubates* is Oleydos, 10½ degrees of longitude to the east of St. Paulo. Between the two stations no form resembling either occurs? *P. Eubates*, like *P. Proteus*, is a form which seems to have spread over the whole of tropical America, but presenting in different regions well-defined and constant local forms, which have been treated by authors as distinct species. Thus, in the plains of Bolivia, south-eastward of the locality of *P. Olyceus*, there occurs *P. Euphanta* (Gray, Cat. p. 31, pl. 9, f. 1). Westward of the Andes, at Guayaquil, it presents as the form of *P. Tincta* (Gray, Cat. p. 30, pl. 8, f. 2). Southward, on the Orinoco, it occurs as *P. Agathis* (Kollar, Beitr. Ins. 3, New Germ. p. 27). Farther north, beginning in the east at Barbice, in Guiana (Cram. t. 279, p. 289), it spreads through Venezuela and New Granada as *P. Eucivada* (Cram. 289, t. 3, f. 1).

\* *P. Euphanta*, n. sp. ♂. Size, shape and ground colour of the wings as in *P. Eubates*. Fore wing strongly produced at tip, as in that species, with a green spot between the sub-median nervure and the second median nervule, divided into two unequal ones by the first median nervule; beneath immaculate. Hind wing with a large crimson spot, divided by the median nervule into four, of which the first, second and third are very much more elongated than in *P. Eubates*. I obtained one example from Dr. Holstvedt and one from a dealer at Para, and was informed they were sent from the interior of French Guiana by M. For. I should consider this to be the *Opilus*, Gled., did he not distinctly say the wings in that species was white.

In Nicaragua and Mexico it recedes farther from the type, as *P. Mplator*\* (Girg. Mus.). The species of South and Central Brazil (*P. Sargathus* and *P. theobis*) appear rather farther removed from the type, but still are probably only further modifications of the same common form.

- P. Sargathus* . . ♀, Fab. B. S. II. 1, 15, 40.  
 ♂, ib. 16, 47 (as *Dimeris*).  
 Var. *Polymerus* ♂, Gohl. Encyc. in. 34, 28.

There is an example of the variety *Polymerus* in the British Museum Collection, said to have been taken by me at Paris. I have no recollection of having taken it and have seen no other Amazonian specimens. On this account, and from the fact of the form being probably confined to South-Eastern Brazil, I think it likely some mistake has occurred regarding the derivation of the specimen.

*P. Quellas*, Gray, Simmons, Zool. Illustr. 1st ser. pl. 32, ♂ and ♀ (as *Polymerus*, Gohl.)

This is the North Brazilian form of *Tarantula*, and is the prevailing species at Pernambuco. It extends also to the middle and lower parts of the course of the river Tapajós, a southern affluents of the Amazon. It certainly does not occur in the alluvial plains of the same river.

#### Group G. *P. Flores*, and allies.

The members in this group are moderately long and slender, with an elongate, gradually-bifurcated club. The males sometimes differ from the females strongly in coloration. They have generally spots or bands of an ochraceous-purplish color on an otherwise or fuscous black ground colour of wings. Although they are "amazon flies," they differ greatly from the *Marbachus* and *Psittaculus* groups of the genus, and they are more immediately connected through *P. Tarantula* with the *Archimedes* group of American *Pepitimus*. Their habits are in perfect contrast to those of the preceding group. They are never seen in hives in the shade of the forest, but prefer the open country, the gardens and plantations near the towns and villages, and the borders of the forest. They fly boldly and sometimes near to great elevations. The females settle on flowers on the borders of the forest. The species, as might be inferred from their more lustrous habits, are of more extensive range than the *Flores* group, some one or more of them being found from Chili to the southern parts of the United States; they are abundant too in the West India Islands, which appear to be the home of the group.

- P. Polymerus* ♂, Crum. 333 A, B.  
 ♀, ib. 16 C, D, (*Androgonis*), and var. ib. 204 A, B.  
 (*Piranthus*).

Common in open places throughout the Amazon region. Both varieties of the ♀ occurred. The species is found from the north of Brazil to Cuba.

\* *P. Mplator*, Gray, List Lep. B. M. No. 156. As the species has not been described, I add a short diagnosis. ♂. Size, shape and ground colour of wings as in *P. Eurimachus* ♀. Fore wing with a large triangular spot behind the median nervule, continued on its apex with a smaller one lying across the cell towards its apex, green, with two rather large cream-colored spots terminating in, one of them between the second and third median nervules, the other lying across the cell. The base of the green spot lies between the first median nervule and the post-median nervule. Hind wing with a creamish palmar spot as in *Eurimachus*. ♀. Similar to ♀ *Eurimachus*, an oblong cream-colored spot lying across the middle of the wing, traversed by the median nervule and third median nervule. Hind wing with a very broad belt, pale ochraceous, crossing the wing, also behind the cell; it consists of five elongate spots, the intervening nervules very faintly indicated, and it does not enter the cell. Nicaragua, from H. DeLachet's Collection.

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*P. Egeophros* ♂, Hübn. Sarrid. Ex.

♀, Brind. Sp. Gen. 358, 201, Lucas in Sagra's Hist. de Cuba, pl. 16, f. 1 (as *Pterichon*).

I found this species only at Camath on the Tocantins, flying rapidly in an orange grove, in company with *P. Thon* and others. The example before me is much smaller than those from other parts of Brazil, and the females of the sub-marginal row on the hind wing are much smaller than represented in Hübnér's figure. The species occurs from the south of Brazil to Cuba. It offers in some countries well-marked local variation, one of which is the *P. Hispanus*, Felder. Lep. Fragments, p. 25.

*P. Thon*, Linn. Crum. 167 A, B.

This common neo-tropical species is subject to much variation. One of the varieties is understood to prevail in the northern part of its range, viz., the West India Islands and the southern parts of the United States, as *P. Coquillettii*, Cr. (185 A, B, and 185 B, 1), but I do not know whether it is sufficiently well marked and constant to be considered as a well defined sub-species. In the Amazonian region *Thon* is found only about the Delta of the river. Its Park specimens the sub-marginal bands of the hind wings are much more rounded and closer than in Crum's sp., or in Hagen's examples before me. On the Upper Amazon it is wholly replaced by the following.

*P. Ceyron*, Ministris, Cat. de la Coll. Imp. Ac. Sc. de St. Petersbourg, p. 111, t. 7, f. 3.

This well-marked and fixed local form, whose "specific rights" have given rise to much useless controversy in some Entomological Journals of Germany, first appears in ascending the river, at Villa Nova. I neglected to notice whilst I searched there, whether it was the exclusive form of *Thon* in the locality. At Ege, however, I convinced myself that it was there the only form which occurred. All the individuals examined agree with the excellent figure of M. Ministris. It appears to occur also at Bahia (Ministris, loc. cit.), probably in the interior of the country (Felder, Lep. Fragments, p. 29).

*P. Teryptus*, . . . ♂, Crum. 177 A, B.

♀, Hübn. Sarrid. (as *Cassius*).

Local var. *Patrus* ♀, Gray, Cat. B. M. p. 43, pl. 7, f. 3, 7, 8.

The male is found throughout the country and offers very little variation. The female varies very much between the Upper and the Lower Amazon. The difference is so great between the sexes that it is only the evidence afforded by having captured *P. Teryptus* and *P. Cassius* in pairs that induces me to place them together. Every example examined shows all the individuals of *P. Teryptus* to be ♂ and all those of *P. Cassius* and *P. Patrus* to be ♀. In colouration the females approach *P. Archibuteo* and species of the *Elera* group. In their variation they show the same laws of substitution of colour which we have seen to prevail in several other species, as in *P. Bellus*, *P. Farcinosa*, *P. Atractus*, &c. They are subject to change of colour of the spot of the face being from white to yellowish, and to lose it altogether, and to the replacement of the marking of the hind wing by yellow. Mr. Gray figures the three varieties which occur on the Upper Amazon, where no example of the true *P. Cassius* has occurred. A feature in the habits of the female may explain why it is subject to these variations: it frequents, like the species of the *Elera* group, the shades of the forest, coming out only on dull days to the borders. The male, although showing the open sunlight, descends this into the sunny breaks and open glades of the forest, where I have often seen it in pursuit of the female, although I have only once detected it in copula.

Group 7. *P. Profetrina*, and allies.

These are generally considered as the most typical forms of the *Papilio* genus, although in some points they seem to resemble more than any other group, the genera *Thais* and *Leucis*. They would, therefore, rather seem to be distant forms, and those forms which would most truly those of neighbouring genera would be more correctly held to be typical, as the *Orissinotus*, but especially the species of the *Almas* group. It is the group, however, which is the most widely spread throughout the world. Besides the elegant oval tube and the style of coloration, they agree in the antennae being short and slender, with a rather abrupt, thick and strongly-curved club. They all frequent the open country. The tropical species congregate in immense numbers to inhabit the margins on the humid margins of lakes, rivers, and on marshy places generally. I have included *P. Profetrina* and allies amongst them, although they have rather a different style of coloration and are not generally included in the group.

*P. Profetrina*, Cress. 17 C. D. and authors.

Not a common species. It is found occasionally from Paris to Peru.

*P. Columba*, Hewitt. Tr. Ent. Soc. 1851, p. 58, pl. 10, f. 1.

This very beautiful species I discovered in November, 1849, at Cuzco, near Villa Rica, on a sandy bank, sitting at the water's edge. I found it independently at Egn. but it appears to be most abundant on the banks of the rivers flowing from the northward, as an Indian trader once brought me an immense number in a split condition from the river Japari.

*P. Profetrina*, L. Cress. 200 A. B. and authors.

Found throughout the country; but most abundant on the Upper Amazon, where it sometimes assembles in dense masses on the moist sand and mud on the banks of the river.

*P. Aetolus*, Bdv. 3188.† Gray, List B. M. (as *Apyctus*, Bdv.).

This species differs from *P. Apyctus*, Bdv. (222 Cress, Hewitt. Tr. Ent. Soc. vol. 2, N. S. pl. 22, f. 3), much more than the latter does from *P. Profetrina*. It has also the character of an independent species in being found in company with *Profetrina* without amalgamating with it. It has not yet been described, I therefore add a short diagnosis. *P. Aetolus* ♀. Smaller than *Profetrina*. Ground colour of the wings of a uniform pale greenish-white, not deeper green towards the base, as *Profetrina* and *Apyctus*. Fore wing with a series of five short black stripes proceeding from the costa as in the allied species; the outer edge with a broad black margin (broadest at the apex of the wing), in the middle of which runs a narrow semi-transparent pale stripe, of equal width, from the costa to near the hind angle. Hind wing with the abdominal border black, and a black stripe running from the costa, near the base, to the middle of the red and black. The outer border black, with a row of simple pale bands along its centre. Beneath the hind wing has two black stripes across near the base, the inner one with a red spot inside it in base, the outer one with a broad red edge on its inner side, as in *P. Apyctus*. I found the species at Egn. always in company with *P. Profetrina*; out of a cluster of a hundred of the latter species settled on moist places, I could generally select one or two of *Aetolus*, conspicuously differing from the others through the difference of its wings.

Group 8. *P. Zagreu*, and allies.

The unique species which I place here seems to be nearest of kind to species of the *Stenandrus* group; but it does not connect well with any other known *Papilio*. As in *P. Focoides*, nature seems to have preserved the usual *Papilio* form to produce the minute likeness of a *Stenandrus*.

*P. Zeyropa*, Doubled. and Hewitt. Gen. D. I., pl. 1\*, c. 1.

The species has been found in Yanametsi and in New Granada. I obtained one example, at Carth, near Ega, in November, 1850. The *Melipotis* which it most resembles is *Lycoria Anagalis*, 1844, a species also confined apparently to the same districts of country as the *Papilio*.

Obs. Having concluded the review of the Amazonian species of *Papilio*, I think it will be useful to employ the results to illustrate farther some of the subjects mentioned in the remarks at the commencement of the article; especially the interesting one of the relation of the Amazonian fauna to those of other countries of tropical America. The species are such conspicuous objects, and are so well represented in collections, that they afford good data for arriving at conclusions, which I think are not likely to be falsified by any subsequent group of which we have to treat. The simplicity and distinctness of the markings and colours also afford good characters by which to measure the amount of modification the species undergo from one locality to another. The Valley of the Amazon, as I said before, has been closed, with regard to its Zoological and Botanical productions, together with Columbia and Guiana, as forming one great province, the Colombian. On the north this is separated from the Mexican province by the Isthmus of Panama; on the west from the Peruvian by the chain of the Andes; the great Brazilian province on the south beginning from the northern borders of the alluvial plains of the Amazon.

The species of *Papilio* confirm, what however is a well-established fact, the distinctness of the Brazilian province; but I think they also afford very strong grounds for considering the Guiana region (comprised between the Atlantic on the one hand, and the rivers Orinoco, Negro and Amazon on the other) as a perfectly independent province, possessing a peculiar character in its productions, and having a very large proportion of species peculiar to itself. I think it will also appear, that the Valley of the Amazon, from the mouth of the river to about 77° W. long. (where Colombian begin to predominate over Guiana forms), has received its fauna chiefly from this region. Of about fifty species and distinct local sub-species of *Papilio* found in the two districts of Guiana and Amazonia, I find that no less than twenty-nine are found in no other country. It is true that a large proportion of species, as far as we are at present aware, seem peculiar to Amazonia; but these are nearly all very closely related to, and some of them evidently local forms or modifications of, Guiana species. In comparing the Amazonian fauna with that of Guiana, it must be

remembered, that it is only the district of the north-eastern seaboard of the latter country and the river valleys near the coast that are taken into consideration, that being the only part of the country of which we have sufficient knowledge. Strictly speaking, the northern shore of the Lower Amazon should be taken as part of Guiana, forming, indeed, the southern frontier of the region; this would reduce only, however, by one species the number peculiar to the Amazon Valley. It is interesting to notice how the numerous local sub-species peculiar to Amazonia, all show themselves to be local modifications of Guiana species; some of them (3) being confined to the Upper Amazon, and others (2) to the Delta at Pará; none of them being found on the northern or Guiana shore of the Lower Amazon. It would thus appear that Guiana is the great centre whence radiated the species which now people the low lands on its borders, at their last emergence from the sea or other waters; and that some of them, in advancing westward into the alluvial plains which occupy the wide basin of the Upper Amazon, and eastward into the apparently recent land forming the southern part of the Delta, have become modified into local sub-species. The other great centres of distribution, Colombia and Brazil, have sent but very few forms, in comparison, to people these vast river valleys. The few Colombian forms found on the Amazon (3 in number) occur only in the extreme west, from Ega onwards. The Brazilian forms (2) occur on the south shore, one indeed (*Ocellularia*) does not reach the alluvial plains at all, being found only in the narrow valleys of the hilly region of the Tapajós, a southern affluent. A third form (*Microrhiza*) might be considered an Amazonian modification of a South Brazilian species (*Protensis*); this occurs only on the southern part of the Delta at Pará. The following table will show these facts in a clearer light.

Species peculiar to the Amazon Valley .. .. .	8*
Local sub-species .. .. .	6†
Species peculiar to Guiana with the Amazon .. .. .	9‡
"    "    Guiana alone .. .. .	2§
Total number of species found in Guiana and Amazonia	26

\* *Hierocles*, *Belina*, *Gadusa*, *Aglais*, *Ecteis*, *Erycinus*, *Colembus*, *Chloris*.

† *Oberea*, *Patria*, *Cymon*, *Gnath. Eucera*, *Ybidius*, *Pezomachus*, *Parasus*.

‡ *Belina*, *Ecteis*, *Perissoma*, *Janus*, *Leucis*, *Agrodes*, *Stenocera*, *Tripus*, *Pezomachus*.

§ *Hippocis*, *Leucis*, *Bria*, *Arctura*, *Pezomachus*.

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Species peculiar to the Amazon Valley and Brazil ..	2*
" " " " and Columbia ..	3†
Total number of species common to Amazonia and Guiana ..	10
Total number of species common to Amazonia and Brazil ..	9
Total number of species common to Amazonia and Columbia ..	12

A bare enumeration of species without further exhibition of the degree of resemblance gives but a very inadequate idea of the true relations of faunas. Thus of the eight species given here as peculiar to the Amazon Valley, two, *Bellier* and *Chabrian*, are strictly speaking but modifications, although well defined and fixed, showing the strong peculiarities of the Upper Amazon region, of *Koenig* and *Tropas*, peculiar Guiana forms. A third species, *Ergetolea*, is restricted to the Guiana side of the Lower Amazon, and might be deducted from the exclusively Amazonian species. A fourth *Echelus*, a remarkable form especially characteristic of, and almost confined to the district of Parí, is connected with the Guiana *Ergetolea* through the intermediate form of *Echelus* of Cayenne. One only *Hirocker*, can be considered as more nearly related to forms of a course of distribution not Guianian, being apparently the Amazonian modification of the South Brazilian *P. Proteus*. Of the confessed local sub-species, the two confined to the delta of the river, *Parosoides* and *Parosides*, are varieties of the Guianian *Hippocampus* and *Ligandides*, and are instances of the peculiar modifying effect of the district of country near Parí. The others, all varieties of Guiana forms, are confined to the Upper Amazon, and exhibit, in the replacement of colours which constitute the variations, the same effects of local conditions there prevailing as the more fixed sub- or representative species of the locality.

From the foregoing considerations, added to what has been advanced in the observations and table at the commencement of this article, I think we may conclude that the facts derived from the study of the distribution of the species of *Papufo* tend to establish the following propositions:—1st, that the Amazon region, although showing great diversity within itself, chiefly from many of

\* *Orellana*, *Cingra*.

† *Zagrus*, *Zagrus*, *Amazon*.

*P. Paros* and *P. Tropasoides* have not been included in these enumerations, from the doubts which are under the head of these species.

the species having become modified in different ways in migrating westward and eastward from a central district on the lower river; on the one hand towards the upper river, and on the other towards the delta, has received by far the greater part of its fauna from Guiana; and, 2nd, that the two countries form together one and the same independent zoological province. It is probable, however, that the distinctiveness of the Guiana-Amazonian fauna will not be so strongly exhibited in other groups, as in the genus *Papilio*; this group being better represented than many others in equatorial countries, especially in the wooded, humid regions of Guiana and Amazonia. The total number of species and distinct local subspecies known to exist there is about fifty, while Brazil proper has only about forty-three, and Colombia with Peru about thirty-eight. Here a result may be mentioned highly interesting, as bearing upon the question of how far extinction is likely to have occurred in equatorial regions during the time of the Glacial epoch in Geology. It has been argued,\* that during this period the refrigeration of the earth extended to the equatorial regions, and enabled many species of temperate zones to pass from one to the other hemisphere. It is supposed, that at that time the climate of the equatorial plains resembled what now exists at six or seven thousand feet of elevation near the equator. It is a tolerably well established fact, that arctic forms then moved twenty-five degrees southward from their homes, and if the decreased temperature then extended to the centre of the tropics, the regions near the equator must have possessed a temperature similar to what is now enjoyed in countries near the twenty-fifth parallel of latitude. Extinction, in this case, must have been at work largely amongst the forms (if there were any) peculiar to the equatorial zone, and the present character of its fauna ought to show, in consequence, a poverty in endemic forms and unmistakable signs, in the shape of local varieties or representative species, of a dependence, on the part of the now existing forms, on those living towards the twenty-fifth parallel of latitude; because, with the returning warmth, the extratropical species then living near the equator, would retreat north and south to their former homes, leaving some of their congeners, slowly modified subsequently by the altered local conditions, to repopulate the zone they had forsaken. The present distribution of the species of *Papilio* does not support the hypothesis of such a degree of refrigeration in the equatorial zone of America, or at least does not counteract

\* Darwin's *Origin of Species*, Chap. XI. p. 373.

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the supposition of any considerable amount of extinction. The fauna of the Guiano-Amazonian region, as far as regards this genus, is in the highest degree peculiar; showing no dependence on that of the countries near either of the tropics. If now we except the local varieties (the inclusion of which would only strengthen the position), there are about forty perfectly distinct species of this genus inhabiting this region, and of these no less than eighteen\* are endemic, all of them so peculiarly restricted in their range, that they are not found, nor any forms closely representing them, even at twelve degrees of latitude on either side the equator. The result is plain, that there has always (at least throughout immense Geological epochs) been an Equatorial fauna rich in endemic species, and that extinction cannot have prevailed to any extent within a period of time so comparatively modern as the Glacial epoch in Geology.

Before discussing the genus *Papilio*, I think it will be considered a service rendered to future students if I add a list of all the published species of the most difficult group of the genus, viz., that of *Acraea* and its allies, with the chief synonymy; my endeavours to understand the Amazonian species having led me to make considerable research into the literature and natural history of the whole of the American species. As in all dominant groups; i.e. groups which seem adapted under the present conditions of existence to increase and spread; the separation into species is extremely difficult. I have found it impossible to bring forms, which have so many different grades of relationship to their next of kin, into a series of well-defined species. I have endeavoured, therefore, to read nature as I have found her, and to arrange the forms according to the amount of difference between them respectively; having regard always to the important point, whether the difference be constant or not amongst the individuals concerned. Thus, differences in one or a few individuals in a locality where the typical form prevails, I have treated as simple varieties; others of more importance, either through the increased amount of difference and the tendency to occur only in certain localities, or through prevailing amongst all the individuals in a locality to the exclusion of the type, I have considered as local varieties or sub-species. The next grade of forms, that in which

\* *Lepidus*, *Cerithes*, *Hippocis*, *Pantonia*, *Eurilates*, *Orethron*, *Pericymus*, *Acraea*, *Epargyreus*, *Belinor*, *Acraea*, *Ichala*, *Lysander*, *Agriotes*, *Tropus*, *Chloritis*, *Strimachus*, *Columba*.

the differences would generally be considered of a specific character, and which involve all the individuals in the locality, but which at the same time have all the appearance of geographical varieties, I have thought it best to treat as doubtful species. The perfectly distinct forms are introduced without a mark of doubt; they are distinct from the species, or series of doubtful species which precede them on the list, but are connected with the doubtful species which follow them. Even with this arrangement I cannot escape from myself that the distinctions are still too arbitrary; viewed in nature the forms appear to blend into each other much more than they do in the following arrangement. Nature, as far as species are concerned, wears a false air of simplicity in all our lists and monographs. There are in some species individual differences which it is difficult not to consider as important as described varieties; the varieties too are of many degrees of importance, some of a very partial nature, others embracing a large proportion of individuals and occurring only in certain localities, which latter might be considered with almost equal justice as local varieties or sub-species. Local varieties again are sometimes of a slight nature, whilst at others assume forms so well defined that it is difficult to exclude them from the category of full species. There is no absolute, well defined distinction between these different grades of relationship, and therefore there are in the following list many forms which I consider is merely a matter of individual opinion under what category to treat them; some varieties might be considered mere individual differences, some local varieties as true or complete species, and so forth. This question, I think, is not of so much importance as certain others which might be raised concerning them. I will only add here that I have considered the series of doubtful forms related to *P. Fortsoni*, sp. 3, to end at sp. 4, beginning those related to *P. Proteus* with sp. 5. I have separated the two series of forms somewhat arbitrarily, as there is no break in the connecting links; *P. Zeani* of the one series being extremely near *P. Phosphorus* of the other. The extreme forms, however, of the two series, viz. *P. Pexares* or *Ephidemas* and *P. Fortsoni*, are so dissimilar that I have thought it best at present to separate the two groups of semi-species which they respectively represent. Future discoveries will, no doubt, serve to link all these forms still more closely together, and it will then remain a remarkable fact that the local modification of form affects the tendency to return into the normal form, or amalgamate, when varieties thus produced are brought by natural re-distribution into contact; because *P.*

*Scutellaria* of the Amazon Valley

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*Hirsuti* (one of the varieties) exists in the same locality with *Ferruginea*, without a single instance occurring of its commingling with that species.

Genus *Paritia* of authors.

Group *Zeuxis*, and allies.

Section 1. Fringe of the wings white or yellowish.

Sp. 1. *P. Scutellaria* ..... ♂, *Cram.* 211, F. G. and authors.  
♀, *ib.* 277, C. D. (as *P. Taffar*).  
— *Gray, Cat. B. M.* p. 58, pl. 5,  
f. 2 (as *P. Cates* ♀).

Hab. Guiana and Amazonia.

Local var. (1) *Zeuxis*... ♂, *Gray, List-B. M.* p. 70 (as *Scutellaria*, J).  
*Bates, Tr. Ent. Soc.* vol. v, N. S. p. 340, note.  
♀, *Gray, Cat. B. M.* p. 47, pl. 10\*,  
f. 4 (as *Zeuxis* ♀).

Hab. Honduras and New Granada.

Local var. (2) *Chilidensis*... ♂, *Gray, Geif. An. King.* pl. 38,  
f. 1, 2.  
*Lucas, Voy. de Castagna, Lep.*  
pl. 2, f. 4 (as *Edippus*).

Hab. New Granada.

Sp. 2. *P. Vestimentum*..... ♂, *Cram.* 211, A. B.  
♀, *Bates, Tr. Ent. Soc.* vol. v, N. S. p. 340.  
var. — *Gray, Cat. B. M.* p. 48, pl. 11,  
f. 4 (as *P. Dieroni*).  
var. — (*Bdv.*) *Lucas, Rev. and Mag. Zool.* 1852, p. 489 (as *P. Phoenicea*).  
var. — *Bdv. Sp. Gen. Pap.* No. 117, (as *P. Cates*).  
var. — *Gray, Cat. B. M.* p. 48, pl. 8, f. 6 (as *P. Cates*).

Hab. Guiana and Amazonia.

Local var. *Cates* (3) ♂, *Gray, Cat. B. M.* p. 58, pl. 10\*,  
f. 2.  
♀, *Bates, Tr. Ent. Soc.* vol. v, N. S. p. 341.

Hab. Upper Amazon.

- Local var. *Phaeon* ( $\delta$ )  $\varnothing$ , Kollar, Beitr. N. Ges. z. 1, t. 5, 4.  
Hab. New Granada.
- Sp. 13. *P. Pyrochla*..... $\delta$ , Doubled. Ann. Nat. Hist. xiv. (1844), p. 416.  
Gray, Cat. B. M. p. 46, pl. 9, f. 2.  
Hab. New Granada.  
var.  $\alpha$ . Gray, Cat. B. M. p. 46.  
Hab. Guayaquil.
- Sp. 14. *P. Zexis*..... $\delta$ , (Bib.) Lucas, Rev. and Mag. Zool. 1852, p. 136.  
id. Voy. de Castelnau, Lep. pl. 2, f. 3.  
Gray, Cat. B. M. p. 46, pl. 9, f. 6 (a slight var.)  
 $\varnothing$ , ib. pl. 9, f. 7.  
Hab. Venezuela and New Granada.
- Sp. 15. *P. Trémani*..... $\delta$ , (Bib. coll. 3) Cress. t. 311, f. v. (as *Protanax*, var.)  
Hab. Guiana.
- Sp. 16. *P. Phloghorus*..... $\delta$ , Bates, Tr. Ent. Soc. vol. v. N. S. p. 311, non.  
Hab. Demerara.
- Sp. 17. *P. Hierochla*..... $\delta$ , Gray, Cat. B. M. p. 55, pl. 10, f. 2.  
 $\varnothing$ , ib. pl. 9, f. 9.  
— ib. p. 56, pl. 10, f. 6 (as *Aglyptus*  $\varnothing$ ).  
— ib. p. 52, pl. 10<sup>a</sup>, f. 7 (as *Thelus*).  
— ib. p. 49 (as *Cyphotes*).  
Hab. Paris.
- Sp. 18. *P. Eolaxus*..... $\delta$ , Gray, Cat. B. M. p. 49, pl. 9, f. 3.  
Hab. Bolivia and Eastern Peru.
- Sp. 19. *P. Postus*..... $\delta$ , Bdv. Sp. Gen. Pap. No. 118.  
 $\varnothing$ , Goeltz, Ent. Méth. ix. p. 37, 36 (as *Nepaloxus*).

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- var. ♀, Gray, Cat. B. M. pl. 10\*, f. 8.  
Hab. S. E. Brazil.
- Sp. ? 10. *P. Stilleri* ..... ♂, Koll. Ann. Wien. Mus. 1839, t. 12, f. 1.  
Hab. S. E. Brazil.
- Sp. ? 11. *P. Orthogynus* .... ♂, (Bdv.) Lucas, Rev. and Mag. Zool. 1838, p. 192, t. 10, f. 3.  
Hab. Corrientes.
- Sp. ? 12. *P. Cymochler* ..... ♀, Gray, Cat. B. M. pl. 10, f. 8.  
Hab. Trinidad ?
- Sp. ? 13. *P. Eriobates* ..... ♀, Bdv. Sp. Gen. Pap. No. 103.  
— Gray, Cat. B. M. pl. 10\*, f. 4.  
♂,                    ib.                    pl. 10\*, f. 3.  
Hab. Venezuela.
- Sp. ? 14. *P. Scrypis* ..... ♂, Bdv. Sp. Gen. Pap. No. 136, t. 1, B. f. 2.  
Hab. New Granada.
- Sp. ? 15. *P. Iphidimus* ..... ♂, Gray, Cat. B. M. pl. 8, f. 1.  
♀,                    ib.                    f. 2 (as  
Iphidimus, doubtfully of Fabricius).  
Hab. Mexico and Honduras.
- Sp. ? 16. *P. Passara* ..... ♀, Gray, Cat. pl. 10, f. 4.  
♂, Bdv. Coll. as *Alector*.  
— B. M. Coll. as *Alector*, Lin.,  
erroneously.  
Hab. Mexico.
- Sp. 17. *P. Ophus* ..... ♂, Gsch. Ent. ix. p. 33.  
Hab. South America.
- Sp. 18. *P. Rivas* ..... ♂, Lin. Syst. Nat. p. 747, 16.  
— ~~Rov.~~ Ent. ix. t. 2, f. 2.  
— Lucas, Rev. and Mag. Zool. 1832, p. 191 (as *Bacter* of Bdv.)  
♀, Hübn. Samml. Ex. (as *Marcus*).  
Hab. Guinea and Paris.
- Sp. ? 19. *P. Bolivar* ..... ♂, Hewitt. Tr. Ent. Soc. 1851, p. 37, pl. 10, f. 8.  
♀, Gray, Cat. B. M. pl. 10, f. 7.  
Hab. Upper Amazon.

Sp. 20. *P. Goffauxi* ..... ♂, Hewitt, Tr. Ent. Soc. 1853, p.  
24, pl. 3, f. 2.

Hab. Upper Amazon.

Sp. 21. *P. Trépozi* ..... Goltz, Enc. ix. p. 33, No. 25.

Hab. Guiana, Pará and Lower Amazon.

Sp. 22. *P. Chabrieri* ..... ♀, Hewitt, Tr. Ent. Soc. 1853, p.  
24, pl. 3, f. 2.

Hab. Upper Amazon.

The following are ♀ insufficiently known, but belonging to this section:—

*P. Tarpénius*, ♀, Ides, Sp. Gen. Pap. 127.

The description of Boisduval is not sufficiently precise to enable us to indicate the position of this insect. In his collection the specimen is now mixed with a Mexican ♂, allied to *Eristalis*.

Hab. Columbia.

*P. Aron*, ♀, Crum, 378 C.

If the fringe in the figure were red instead of white, it would represent exactly the ♀ of *Eristalis*.

Hab. Brazil (?).

*P. Lyronce*, ♀, Gray, List. p. 66; Talbot, ♀, Paper. Acad. Scien.  
t. 13, f. 3.

I have not been able to consult the figure of Esper.

Hab. Surinam.

*P. Archier*, ♀, Linn. Clerck, Icon. t. 23, f. 1.

The figure of Clerck represents a ♀ of some species allied to *Fortunaria*.

Hab. Surinam.

Section 3. Fringe of the wings rose-coloured.

Sp. 23. *P. Aghape* ..... ♂, Gray, Cat. B. M. p. 55, pl.  
10, f. 5.

Hab. Pará.

Sp. 24. *P. Euristea* ..... ♀, Crum, 29 F.

Hab. Dutch Guiana.

Sp. 25. *P. Panchana* ..... ♀, Crum, 278 C. D.  
♀, Bates, Tr. Ent. Soc. vol. v.  
n. s. p. 148.

Hab. Dutch and English Guiana.

- Sp. 26. *P. Ipanhe*.....♂, *Cram.* 29 C. D.  
 — *Eryman*, *Goeth.* and *Hdv.*  
 — *Gray*, *Cat. B. M.* (as *Brissonia*, *Hüb.* ♂)  
 ♀, *Cram.* 286 C. D. (as *Arctus*).  
 — *Hdv.* *Sp. Gen. Pap. No.*  
 113, part (as *Pantopus*, ♀).  
 — *Goeth. Ency. in. Pap. No.*  
 31 (as *Aschius*, L. part).  
 — *Hüb. Samml.* (as *Arctus*).  
 — *Id.* (as *Pantopus*).  
 — *Hüb. Verzeich.* (as *Brissonia*).  
 — *Gray*, *Cat. pl. 8, f. 8* (as ♀  
 of *Brissonia*, *Hüb.*)

Hab. Guiana, and Upper and Lower Amazon.

- Local var. (3) *Parodes*...♂, *Gray*, *Cat. p. 54, pl. 8, f. 3*  
 (as *Parodes* ♂).  
 ♀, *Gray*, *Cat. pl. 8, f. 4* (as  
 (*Parodes* ♀).  
 — *Gray*, *Cat. p. 57* (as *Saoria*),  
*pl. 10, f. 1* (as *Saoria*, var.)

Hab. Pará.

- Sp. 27. *P. Eclerus*.....♂, *Hüb. Samml.*  
 ♀, *Id.* (as *Eclerus*).  
 ? var. ♀, *Gray*, *Cat. p. 55, pl. 10\*, f.*  
 1 (as *Sparticus*, *Hüb.*)

Hab. Pará.

- Local var. (5) *Eclerus*...♂, *Bates*, *Tr. Ent. Soc. vol. v.*  
*N. S. p. 345, note.*

Hab. Cayenne.

- Sp. 28. *P. Ergastus*.....♂, *Gray*, *Cat. p. 56, pl. 8, f. 5.*  
 ♀, *Id.* p. 56.  
 ♀, *Bates*, *Tr. Ent. Soc. vol. v.*  
 p. 344.

Since my description of the ♀ was printed, I have found that Mr. Gray has already given an excellent description of it in the place quoted.

Hab. Lower Amazon.

- Sp. 239. *P. Escribae* ..... ♂, Exped. Acad. Schm. t. 13,  
t. 3, f. 2.  
— Cross 979 A. B. (as *Escribae*  
L. ♂)  
♀, Gray, Cat. p. 51, pl. 9, f. 8.  
var. ♀, Habes. Zool. f. 297, 8 (as  
*Nephele*).
- Hab. Guiana, Lower Amazonas and Pará.  
Local var. (7) *Officineria*. ♂ and ♀, Bates, Tr. Ent. Soc.  
vol. v. N. S. p. 345.
- Hab. Upper Amazonas and New Granada.  
Local var. (8) *Eurypterus*. ♂, Gray, Cat. p. 51, pl. 9, f. 1.  
Hab. Bolivia.

- Sp. 240. *P. Erimocera* ..... ♂, Cross 280 E. F.  
♀, Bolv. Sp. Ges. Pap. No. 123  
(as *Arypterus*).
- Hab. English Guiana, Venezuela and New Granada.  
Local var. (9) *Agathodes*. ♂, Kollar, Beitr. N. Grun. p. 2.  
Hab. Orinoco.  
Local var. (10) *Thomis*. ♂, Gray, Cat. p. 56, pl. 9, f. 5.  
Hab. Guayana.  
Local var. (11) *Mphala* (Gray) ♂ and ♀, Bates, Tr. Ent.  
Soc. vol. v. N. S.  
p. 395, note.  
? ♀, *Dorissus*, Gray, MSS.  
List, p. 64.
- Hab. Nicaragua and Mexico.

- Sp. 241. *P. Zecyrtus* ..... ♂, Fab. Ent. Syst. ii. 1, p. 15,  
46.  
♀, Fab. Ent. Syst. iii. 1, p. 16,  
47 (as *Diana*).  
var. ♀, Gray, Cat. p. 54, pl. 10\*,  
f. 2. (as *Expalca*).
- Hab. S. E. Brazil.  
Local var. (12) ♂ *Polyurus*. . . Godt. Eryt. iv. p. 35, 38.  
Hab. S. E. Brazil.  
Local var. (13) *Ocellus*. . . ♂ and ♀, Swains. Zool. Illustr.  
1st Ser. pl. 92 (as  
*Polyurus*, Godt.)  
Gray, Cat. p. 57 (as  
*Ocellus*).
- Hab. Pernambuco and River Tapajós.

The following are ♀ of this section, which at present cannot be  
named:—

*P. Numa* ♀, Bolv. Sp. Ges. Pap. No. 116.

This species is represented by a solitary specimen in Dr. Boisduval's Collection. It resembles the ♀ of *Lysander*, but the forewings are much more rounded in outline, and the muscular belt of the hind wing is composed of much more widely separated spots, which are of an oval or rounded hexagonal shape.

Precise habitat unknown.

*P. Callista*, n. sp. ♀, Gray, Cat. B. M. p. 49, pl. 5, f. 10 (as ♀  
*Eracca*).

This is the ♀ of some species allied to *Lysander*. It comes from Bolivia, whence no ♂ allied to *Lysander* has as yet been received, to my knowledge.

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The following are ♀ of this section, which at present cannot be named:—

*P. Nova* ♀, *Idr. Sp. Gen. Pap. No. 116.*

This species is represented by a solitary specimen in Dr. Beiswiler's Collection. It resembles the ♀ of *Epanale*, but the forewings are much more rounded in outline, and the macular belt of the hind wing is composed of much more widely separated spots, which are of an oval or rounded lozenge-shape.

Precise habitat unknown.

*P. Colchica*, *reb. ♀*, Gray, *Cat. B. M.*, p. 43, pl. 3, f. 14 (as ♀ *Elaeis*).

This is the ♀ of some species allied to *Epanale*. It comes from Bolivia, whence no ♂ allied to *Epanale* has as yet been received, to my knowledge.