

Notes upon **EXOTIC LEPIDOPTERA**, chiefly from the Philippine Islands, with descriptions of some new species.

BY TRYON REAKIRT.

I have not confined myself to descriptions of Lepidoptera from the locality above indicated alone; but where other species have been required from other places to complete a natural group, when I have had them in my collection, I have introduced them for the purpose of showing the shades of resemblance and the transition from one species to another through different degrees of latitude. Climatal influence often exercises great power in the variation of species; some are changed so as to be scarcely recognizable, bearing no similitude to their normal condition.

Besides, those associated by nature in their form and habits, I have also, in addition to a number of new species, described all the remaining Asiatic, including the surrounding islands, African and Australian Lepidoptera in my collection, for this reason:

Few descriptions of exotic Lepidoptera are to be found in the English language, and where there are such, they are scattered through a multitude of proceedings of different societies, none of which are American; or are to be found in some larger and more collective work, which, most probably, is inaccessible to a majority of Entomological students.

Dr. Boisduval has attempted to fill the void created by the want of a descriptive work with his *Spécies Général*, but this, besides being imperfect in many respects, is also, unfortunately, not in our language. On account of the great need of such a work I have attempted the description of a small portion of the Eastern Lepidoptera, giving as full synonymy as possible, contrasting my specimens with author's descriptions, and remarking their differences and peculiarities.

In order to give a complete list of authentic localities in which the species described have been found, I have combined those mentioned in the Catalogue of the British Museum, and in the collections of the East India Company and Dr. Boisduval, together with mine, which furnishes many new geographical locations for well known species.

Localities mentioned by authors, but of which the species are included in none of the above, I have presented in the form of a quotation, with the authority appended.

I must also state, that for a great deal of valuable information respecting the habits of the butterfly in its various stages, and also for a great part of the larval descriptions introduced, I am indebted to the notes and illustrations of these, which are contained in the Lepidopterous Catalogue of the Museum of the East India Company, compiled by Messrs. Horsfield and Moore. Other sources of knowledge I have appropriately credited in their proper place.

It has been my object, as far as possible, to collect all reliable information upon the described species, forming of each a perfect diagnosis, so far as scanty sources of information would permit me. For the first periods of their ephemeral existence I have been obliged to rely exclusively upon the statements of others, whilst I can but regret that my collection is not so full as to enable me to fulfill at least the latter part of the plan I had laid out, and I can only hope that the constant addition of new specimens will permit me in time to finish it more thoroughly.

ORNITHOPTERA, Boisd.

1. *Orn. Rhadamanthus*, Boisd.

Orn. Rhad. Lucas, Pap. Exot. p. 5, (*Orn. Amphrisius* ♂) t. 2. f. 1. (1835).

Boisd., Sp. Gén. I. p. 180. n. 8. (1836).

E. Doubled., Cat. Brit. Mus. p. 2. (1844).

Diurnal Lepidopt., I. p. 4. n. 10. (1846).

Cat. Lep. Mus. E. I. Co. I. p. 88. n. 178. (1857).

Pap. (Orn.) Rhad. G. R. Gray, Cat. Lep. Br. Mus. pl. I. p. 6. n. 14. (1852).

“ List. Lep. Brit. Mus. Pt. 1. p. 5. (1856).

*Pap. Astenous** Eschsch. Voy. Kotzebue. t. 4. f. A. B. C. (1830).

“*Male*.—Superior wings, resembling those of *Heliakon*,† black, with the nervules more or less bordered with obscure white or gray rays. Inferior wings, very triangular, golden yellow, the nervules and a serrated marginal band, deep black; this last is preceded towards the anal angle by blackish atoms; emarginations entirely black.

“Below, the fore wings are the same as above; the hind wings without the blackish atoms. Head and thorax black, a red collar on the prothorax near the head; abdomen black above and yellow beneath; the breast marked with large red spots at the base of each wing.

“*Female*.—Of greater size, the inferior wings being much larger,

* *Pap. Astenous* is Fab. sp., a synonyme of *Orn. Pompeus* Cram.

† *Orn. Heliakon*, Boisd. is *Orn. Pompeus*, Cram.

with the emarginations white; preceding the border a row of oval spots, resembling those of the female of *Heliacon*, separated or united by the black serrations of the marginal band, and which sometimes are small, in others much larger; the superior wings are striated with white rays as in the male.

“Var. *a. Female* has the outer border confluent with the spots, so that the inferior wings are black, with a large golden-yellow palmated spot, as in *Helena*.

“Cochin China, Manilla. (Coll. Boisd.)

“This species is distinguishable from *Heliacon* by the absence of white emarginations in the male, by the narrowness of those of the female, by the size of the red spots on the lower part of the thorax, but above all, by the very triangular form of the hind wings of the male.”
Boisd.

Antennæ and legs black. Dr. Boisduval omits mentioning that the black atoms on the inferior wings terminate anteriorly in a point, that the discal cell is also covered with fine long black hairs, that the anal margin is very broad and black, and that the anal valves are yellowish white; expanse 5.13 inches.

My *female* agrees with Var. *a.* Boisd. with the addition of three white discal rays and white emarginations on the fore wings; a black tooth, extending from the black macular sub-marginal band up the sub-median interspace of the hind wings; and a sub-marginal row of six yellow spots, very small on the upper surface, much enlarged below, the first three being triangular, and the last three oblong, divided by the nervules; these spots are mentioned in Lucas' description; the palmated spot, just before the black anal margin, becomes pale drab: expanse $6\frac{1}{2}$ inches.

Lucas says in his description, that the black border of the male is covered with a fine yellow down, of which I can see nothing in my specimens. He figures this species under the erroneous name of *Amphrasius* ♂; it is rather less than my ♂, expanding only 4.75 inches; it should not have been colored orange near the black marginal band of the hind wings, and the outer angle of the secondaries is too much rounded; otherwise the figure is correct.

Hab.—Philippines, (In my collection.)

India, (Coll. E. I. Co.)

Nepaul, Moulmein, Hong-Kong, (Coll. Brit. Mus.)

An extract from Capt. Mortimer Slater's "Notes" (p. 390) in the Appendix to Cat. Lep. Mus. E. I. Co. I. p. 2, says: "this species was common at Dacca, 1845, and at Darjeeling, being partial to the feathery scarlet flowered plant about which they hover, and may be easily caught by the hand, as its flight is heavy."

ATROPHANEURA, nov. gen.

HEAD, large.

Eyes, oval, prominent.

Antennæ, long, with the club, elongate, annulated.

Labial palpi; first and second joints, short; third, long; hairy, particularly the last joint.

THORAX robust, clothed with long hairs, nearly equalling *Ornithoptera* in size. Prothorax developed more than in *Papilio*.

ABDOMEN, large, very long, extending to the anal angle of the posterior wings, and furnished, in the male, with a pair of very large anal valves.

ANTERIOR WINGS, sub-triangular, elongate, rounded at the apex; inner margin not more than half the length of the costal; costal and median nervures very prominent; upper disco-cellular nervule less than the space between the two discoidal nervules; third sub-costal nervule thrown off at the end of the cell; median and sub-median nervures are united by an interno-median.

POSTERIOR WINGS, sub-ovate, deeply dentate, prolonged in the male in a small tail; pre-costal nervure, bi-branched, the inner division bent downwards and united to the costal nervure; lower disco-cellular nervule atrophied, the discal nervule in conjunction with the first median nervules at the extremity of the cell, and appearing as a third sub-costal nervule; discoidal cellule, very much elongated, the median nervure, which is very stout, forking near its lower extremity; the third nervule at $\frac{3}{4}$ ths of its length, the second is separated from the first by an interval of little more than half a line; a deep channel on the anal margin for the reception of the abdomen; sub-median interspace very large, thrown over into a fold on the upper surface.

LEGS, long and powerful; anterior tibiæ with a long spine; tarsi, first joint, equal in length to the rest combined, the fourth joint, the shortest; claws, all simple.

2. *Atroph. erythrosoma*, nov. sp.

Male.—Antennæ, black; head, red; palpi, first article black, second and third bright red; thorax black above, with a broad red dorsal band, and blood red beneath; abdomen bright red, two lateral black spots on the second and third segments; a row of transverse black dashes below, commencing at the base and extending to the anal valves, which are reddish brown; length of body, 1.93 inches; legs, black.

Wings. Upper surface black, covered with a purplish-blue reflection; the secondaries below the median nervure suddenly become light drab, and are produced in a tooth, a little longer than that of *Pap. Emalthion*.

Below, primaries as above; secondaries black, a series of six red spots along the outer margin, somewhat resembling those of *Emalthion*, three near the anal angle, crescent shaped externally, enclosing between themselves and the margin three black spots, the two inner red spots are prolonged interiorly, and contain two black lunules, the inner one being incomplete; above these, and near the margin three detached spots of the same color, decreasing in size as they approach the outer angle; the lowest of these last three, has a small spot above it, near the end of its interspace. Expanse 5.88 inches.

Hab.—Philippines. (In my collection.)

Pap. Varuna is allied more closely to this unique species than any other member of the genus *PAPILIO*, but even from this its nervular system is so very distinct, that no one could hesitate on this ground alone to separate it from *PAPILIO*. Another cause for separation would be the large thorax, length of abdomen, and the large anal valves, which seem to connect it with *ORNITHOPTERA*, but here again, its neuration differs so that it cannot be assigned to that genus.

Possessing thus a portion of the generic characters of each, its proper position is manifestly between them.

I am indebted, not only for this fine species, but for all mentioned as from the locality of the Philippines, to my friend, Mr. E. F. Lorquin, Jr., of San Francisco, Cal. At least half of my Eastern Lepidoptera are from these Islands, although many species are likewise common to China and the Indies.

PAPILIO Linn.3. *Pap. Emalthion*, Hübn.

♂ *Iliades Emalth.* Hübn., Samml. Exot. Schmett. II. t. 117. (1806).

Pap. Emalth. Boisd., Sp. Gén. I. p. 196. n. 7. (1836).

De Haan., Verh. Naturl. Gesch. p. 24. (1839).

Diurnal Lepidopt. I. p. 10. n. 31. (1846).

G. R. Gray, Cat. Lep. Br. Mus. Pt. 1, p. 14. n. 48, ♀ Pl. 5. f. 4. (1852).

G. R. Gray. List. Lep. Br. Mus. pt. I. p. 17. (1856).

Pap. Floridor. ♂. Godt. Encyc. Sup. p. 809. n. 10—12. (1819).

Pap. Krusensternia. Eschsch. Voy. Kotzebue. t. 3. f. 5. (1830).

“Size of Memnon.

“*Male*.—Wings black; the superiors having long grayish rays at the extremities; the inferiors marked on their posterior half by large whitish-gray spots, separated by the nervules; the anal angle marked with a red spot, surmounted by a group of grayish-blue atoms. Below, the primaries resemble the upper surface, with a triangular blood red spot at the base; the secondaries have four red spots at the base, separated by the nervures, and along the outer margin a row of annulated spots of the same color, of which the outermost are incomplete, and the two inner ones elongated; the second of these last being the largest, and containing two black oval spots.

“*Female*.—Wings blackish; primaries striated on their middle with long whitish rays, and the base covered by a large triangular blood red spot, powdered with white atoms.

“Secondaries of a brown-black, having three red-ringed spots on the outer margin, proceeding from the anal angle, of which the middle one is carried up to the base through the lower median interspace; in passing through the discoidal cellule it is cut by a bifid white nervure. Below, the primaries are as above. The secondaries the same as in the male, that is, with the three outermost rings open, whilst the fifth spot extends towards the base, as on the upper surface; whereas in the male this is most commonly interrupted.

“Manilla, (Coll. Boisd.)”—*Boisd.*

My specimens differ somewhat from the above description.

Male.—Body brownish, pale underneath; femora have white hairs on the side; the anal spot is a lunule. Below it has five spots at the base of the secondaries, the last extending some distance along the anal margin; there are seven spots on the outer margin, pupilled with black, the four outermost being imperfect; on the first and seventh, above the black center, and on the sixth, between the two black pupils, small groups of pink white atoms. Emarginations of the hind wings whitish,

a projecting tooth in the lower half of the outer margin; expanse 5.13 inches.

Female.—On the secondaries four marginal annulose spots; the prolongation of the second becomes pink and white above the first black spot, as far as the median nervure, above that, it again turns to bright red; some bluish atoms near the outer margin.

Below, the marginal red basal spot is not near so long as in the male, and the extension of the second marginal ring is continued only to the discoidal cellule. Body brown; expanse 5.22 inches.

Hübner gives a good figure of the male, but the divergent striæ on the posterior wings are more greenish than he represents.

Gray's figure of the ♀ gives for its expanse 6 inches. It also differs from my specimen. He gives the body a row of lateral ochreous spots, of which I can see nothing in my specimen; not near so much red on the upper surface, that at the base being mixed with white; only three marginal annulations, the third being very indistinct. The pink band, from the margin to the base, almost obsolete, and represented by but two whitish lines.

Below, the only perceptible difference is in the size of the basal spots, and the length of the sixth marginal spot, which, in mine, extends to the discal cell, whilst that of the Brit. Mus. does not proceed so far.

Eggs, extracted from the body of the female, round, white.

Hab.—Philippines, (In my collection.)

Manilla, (Coll. Brit. Mus.)

4. *Pap. Memnon*, Linné.

♂ *Pap. Memnon*. Linn., Syst. Nat. II. p. 747. n. 13. (1767).

Cram., I. t. 91. f. c. (1775).

Herbst, Pap. I. t. 6. f. 2, 3. (1783).

Fab. Ent. Syst. III. i. p. 12. n. 36. (1793).

Godt. Encyc. IX. p. 29. n. 10. (1819).

Esper, Ausl. Schmett. t. 20. f. 3. (1801).

Swainson, Zool. Ill. 2nd ser. t. 95. (1832).

Boisd., Spéc. Gén. I. p. 192. n. 6. (1836).

De Haan. Verh. Naturl. Gesch. p. 23. t. 3. f. 1. (1839).

E. Doubled., Cat. Brit. Mus. pt. 1. p. 2. (1844).

Diurnal Lepidopt., I. p. 10. n. 30. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. pt. 1. p. 13. n. 47. (1852).

Nat. Library, XXXI. Duncan, p. 97. (1852).

G. R. Gray. List. Lep. Brit. Mus. pt. I. p. 14. (1856).

Cat. Lep. Mus. E. I. Co. I. p. 99. n. 202. (1857).

Iliades Memnon Hübn., Verz. bek. Schmett. p. 89. (1816).

Pap. Arbates. Zinken Sommer, Nova Acta Acad. Nat. Cur. XV. p. 151. (1831).

Male.—Wings black; upper surface with a greenish reflection; anterior wings with long grayish striæ, the posterior wings with greenish; the upper wings have a triangular red or ochreous spot at the base on the under side, and there are likewise five small red marks on the same part of the inferior wings; the latter are deep black anteriorly and dark cinereous behind; the cinereous portions containing two rows of deep black rounded spots, that next the angle encircled with yellow. Under surface of fore wings marked with whitish-gray rays. Body black, dusted sparsely with blue and golden green atoms. Expanse 5.25 inches.

Hab.—Java, (Coll. Brit. Mus. and E. I. Co.)

Philippines, (In my collection.)

Var. *a*. ♂. *Pap. Androgeos*. Cram. I. t. 91. f. A. B. (1775).

Boisd., Sp. Gén. I. p. 193. n. 6. (1836).

E. Doubled., Cat. Brit. Mus. pt. 1. p. 2. (1844).

Diurnal Lepidopt., I. p. 10. n. 30. (1846).

G. R. Gray, *Pap. Memnon*, var. *a*. Cat. Lep. Brit. Mus. Pt. I. p. 13. n. 47. (1852).

Nat. Library, XXXI. Duncan, p. 98. (1852).

G. R. Gray, List. Lep. Brit. Mus. p. I. p. 14. (1856).

Cat. Lep. Mus. E. I. Co., var. *a*. p. 99. n. 202. (1857).

Pap. Memnon. Esper, Ausl. Schmett. t. 8. f. 1. (1801).

Iliades Mestor. Hübn., Verz. bek. Schmett. p. 89. (1816).

"This variety of the ordinary male differs from it, in having the black spots of the first row on the posterior wings, preceded by bluish lunules, and the two inner spots of each row, surrounded by reddish violet."—*Boisd.*

In my specimens, the reddish violet extends to three spots on the marginal row, and only partly covers those of the internal. Expanse 5.75 inches.

Hab.—Philippines, China, (In my collection.)

China, (Coll. Boisd.)

Pinang and Darjeeling, (Coll. E. I. Co.)

Borneo, Northern India, China, (Coll. Brit. Mus.)

The variations of the female are much more numerous than those of the male, and more interesting, inasmuch as they have changed so greatly as to scarcely retain a vestige of their normal condition; not only in color, but in outline also do they differ.

Dr. Boisduval says, "that very rarely, there are some found in Java which resemble the male. If it were not for this rarity, we should be apt to consider them as the normal type."

Var. *a*. ♀. *Pap. Anceus*. Cram. III. t. 222. f. A. B. (1780).

Boisd., Sp. Gén. I. p. 193. n. 6. (1836).

E. Doubled., Cat. Brit. Mus. Pt. p. 2. (1844).

Diurnal Lepidopt., I. p. 10. n. 30. (1846).

G. R. Gray, *P. Mem.* var. *b*. Cat. Lep. Br. Mus. Pt. I. p. 13. n. 47. (1852).

Nat. Library, XXXI. Duncan, p. 98. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 14. (1856).

Cat. Lep. Mus. E. I. Co. var. *b*. I. p. 100. n. 202. (1857).

Iliades Anceus Hübn., Verz. bek. Schmett. p. 88. (1816).

"Similar to the male, but with an orange body, and a triangular white spot on the upper surface, at the base of the fore wings; the anal angle ochreous on both sides."—*Boisd.*

Hab.—Sumatra, (Coll. Boisd. and Brit. Mus.)

Var. *β*. ♀. *Pap. Laomedon*. Cram., I. t. 50, f. A. B. (1775).

Boisd., Sp. Gén. I. p. 193. n. 6. (1836).

Diurnal Lepidopt., I. p. 10. n. 30. (1846).

G. R. Gray, *P. Memnon*, var. *c*. Cat. Lep. Br. Mus. Pt. I. p. 13. n. 47. (1852).

Nat. Library, XXXI. Duncan, p. 98. (1852).

List. Lep. Brit. Mus. Pt. I. p. 14. (1856).

Cat. Lep. Mus. E. I. Co. var. *c*. p. 100. n. 202. (1857).

Pap. Memnon (pt.) Fab. Ent. Syst. III. i. p. 12. n. 36. (1793).

Iliades Laomedon Hübn., Verz. bek. Schmett. p. 89. (1816).

"Has a triangular red spot at the base of the superior wings, and the black spots of the second row, on the margin of the hind wings below, are more or less encircled by ochreous."—*Boisd.*

Hab.—Java, Northern India, (Coll. Brit. Mus.)

Java, (Coll. E. I. Co.)

♀. *Pap. Laomedon*. var. *A*.

G. R. Gray, *Pap. Memnon*, var. *d*. Cat. Lep. Brit. Mus. Pt. I. p. 13. n. 47. (1852).

Cat. Lep. Mus. E. I. Co. var. *d*. I. p. 100. n. 202. (1857).

"Like *P. Laomedon* in form and general appearance, but the primary wings are marked on the inner margin by a space of white. The secondary wings black, speckled between the nervules with pale blue scales."—*G. R. Gray*.

Hab.—Northern India, (Coll. Brit. Mus.)

Cherra Poonjee, (Coll. E. I. Co.)

♀. *Pap. Laomedon*. var. B.

De Haan, Verh. Nat. Gesch. p. 24. t. 3. f. 2. (1839).

G. R. Gray, *P. Memnon*, var. e. Cat. Lep. Brit. Mus. Pt. I. p. 13. n. 47. (1852).

Cat. Lep. Mus. E. I. Co. var. e. I. p. 100. n. 202. (1857).

Hab.—"Eastern Archipelago, (Padang)"—*De Haan*.

♀. *Pap. Laomedon*. var. C.

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. *P. Memnon* var. f. p. 13. n. 47. (1852).

Cat. Lep. Mus. E. I. Co. var. f. I. p. 100. n. 202. (1857).

"Like the former, but without the buff space at the anal angle of the secondary wing, while beneath, at the same part, there is a large space of yellowish red, spotted with black."—*G. R. Gray*.

Hab.—Penang, (Coll. Brit. Mus.)

Var. γ. ♀. *Pap. Agenor*. Clerck. Icon. t. 15. (1759).

Linn. Syst. Nat. II. p. 747. n. 14. (1767).

Cram. I. t. 32. f. A. B. (1775).

Herbst, Pap. t. 8. f. 3. (1784).

Fab. Ent. Syst. III. i. p. 13. n. 39. (1793).

Esper, Ausl. Schmett. t. 26. f. 1. (1801).

Donovan, Ins. of China, pl. 24. f. 2. (1805).

Godt. Encyc. IX. p. 28. n. 9. (1819).

Boisd., Sp. Gén. I. p. 194. n. 6. (1836).

E. Doubled., Cat. Brit. Mus. Pt. 1. p. 2. (1844).

Diurnal Lepidopt., I. p. 10. n. 30. (1846).

G. R. Gray, *P. Memnon*. var. g. Cat. Lep. Brit. Mus. Pt. I. p. 13. n. 47. (1852).

Nat. Library, XXXI. Duncan, p. 97. t. 2. f. 1. (1852).

G. R. Gray, List. Lep. Br. Mus. Pt. I. p. 14. (1856).

Cat. Lep. Mus. E. I. Co. I. p. 100. n. 202. (1857).

Iliades Agenor. Hübn., Verz. bek. Schmett. p. 89. (1816).

"Upper wings blackish, marked with numerous longitudinal rays of a grayish-ash color, each of the wings having a large blood-red or ochrey-yellow triangular patch at the base. The inferior wings are waved on the hinder margin, and narrowly edged with white in the emarginations, the disk almost entirely occupied by a broad white band divided by the dark nervures, the hinder portion dusky with a series of deep-black spots of an ovate or rounded form; that, placed on the anal angle, smaller than the rest and encircled with fulvous, which color extends to the extremity of the internal border; on the under side, as above, and spotted with red or ochre-yellow at the base; body black, the prothorax marked with several white points."—*Duncan*.

In my specimen the discal white band is surmounted by scattered bluish-green atoms. Expanse 6.13 inches.

Hab.—Philippines, (In my collection.)
 Northern India, (Coll. Brit. Mus.)
 Java, (Coll. E. I. Co.)

Var. ♂. ♀. *Pap. Achates*. Cram., II. 182. f. A. B. t. 243. f. A. (1777).
 Herbst, Pap. t. 15. f. 1. (1784).
 Fab. Ent. Syst. III. i. p. 9. n. 24. (1793).
 Esper. Ausl. Schmett. t. 28. f. 1. (1801).
 Godt. Encyc. IX. p. 64. n. 107. (1819).
 Boisd. Sp. Gén. I. p. 194. n. 6. (1836).
 E. Doubled., Cat. Brit. Mus. (1844).
 Diurnal Lepidopt., I. p. 10. n. 30. (1846).
 G. R. Gray, *P. Memnon*, var. *i*. Cat. Lep. Brit. Mus. Pt. 1. p. 14. n. 47. (1852).
 G. R. Gray, List. Lep. Brit. Mus. Pt. 1. p. 14. (1856).
 Cat. Lep. Mus. E. I. Co. var. *i*. I. p. 100. n. 202. (1857).
*Pap. Achatia*des. Esper, Ausl. Schmett. t. 28. f. 3, t. 29. f. 1. (1801).
Achillides Achates. Hübn., Verz. bek. Schmett. p. 85. (1816).

“Inferior wings, ending in a large black tail. Fore wings resembling those of *Agenor*, with the basal spot sometimes red, sometimes fulvous. Hind wings black; disc white, divided by black nervules into eight unequal spots; emarginations of a grayish-white, except the two outermost and that on the anal angle, which are ochry-yellow or brownish-red. Below, as above, with three little yellow or red marks at the base of the hind wings. Body black, with a broad lateral yellow band on the abdomen, and several white spots on the prothorax.”—*Boisd.*

Hab.—Northern India, (Coll. Brit. Mus.)
 Java, (Coll. E. I. Soc.)

♀ *Pap. Achates*. var. A.
 De Haan, Verh. Natural Gesch. p. 24. t. 3, f. 3. (1839).
 G. R. Gray, *P. Memnon*, var. *h*. Cat. Lep. Brit. Mus. Pt. 1. p. 13. n. 47. (1852).
 Cat. Lep. Mus. E. I. Co. var. *h*. I. p. 100. n. 202. (1857).

Hab.—“Eastern Archipelago.”—*De Haan.*

♀ *Pap. Achates*. var. B.
 G. R. Gray, *P. Memnon*, var. *j*. Cat. Lep. Brit. Mus. Pt. 1. p. 14. n. 47. (1852).
 G. R. Gray, List. Lep. Brit. Mus. Pt. 1. p. 14. (1856).

“Like *P. Achates* in form and general appearance, but without the

red triangular spot at the base of the primaries. The secondary wings are marked in the place of the red, as in *P. Achates*, with ochraceous."—*G. R. Gray*.

Hab.—Java, (Coll. Brit. Mus.)

Var. ϵ . ♀ *Pap. Alcanor*. Cram., II. t. 166. f. A. (1776).

Esper, Ausl. Schmett. t. 34, f. 2. (1801).

Boisd., Sp. Gén. I. p. 194. n. 6. (1836).

E. Doubled., Cat. Brit. Mus. (1844).

Diurnal Lepidopt., I. p. 10. n. 30. (1846).

G. R. Gray, *P. Memnon*, var. *k*. Cat. Lep. Br. Mus. Pt. 1. p. 14. n. 47. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. 1. p. 14. (1856).

Cat. Lep. Mus. E. I. Co., var. κ . I. p. 101. n. 202. (1857).

Pap. Alphenor. Fab. Sp. Ins. II. p. 4. n. 11. (1781).

Herbst, Pap. t. 16, f. 1. (1784).

Pap. Achates β . Fab. Ent. Syst. III. i. p. 9. n. 24. (1793).

Godt. Encyc. IX. p. 64. n. 107. (1819).

Achillides Alcanor. Hübn., Verz. bek. Schmett. p. 85. (1816).

Fore wings cinereous, striated with brown rays; costal half of basal patch, blood red, posterior portion deep black. Posterior wings tailed, black; a row of four sagittate spots on the disc, white anteriorly, changing to pink in their hind part; a small pink spot at the extremity of the cell, and another above the first discal mark. Emarginations wide, fulvous; the two outer edged with white; the two inner very large, and reddish-brown. A large reddish-brown anal spot containing a large black pupil.

Below, the fore wings become whitish-gray with black rays. Hind wings deep black, four ferruginous spots at the base; the transverse macular band becomes pure white, the extremities of the third and fourth spots produced, until they unite with the two large inner marginal lunules. Expanse 6.38 inches.

Body black, with a broad yellow band on the sides of the abdomen; prothorax marked with white.

Hab.—China, (In my collection.)

Cherra Poonjee, (Coll. E. I. Co.)

Northern India, (Coll. Brit. Mus.)

Swainson, Zool. Ill. 2nd series t. 95. (1832).

Larva. Boisd., Sp. Gén. I. p. 195. n. 6. t. 1. f. 2. (1836).

Pupa. Nat. Library, XXXI. Duncan, p. 98. (1852).

Cat. Lep. Mus. E. I. Co., t. 11. f. 1. 1a. (1857).

The anterior part of the body is considerably attenuated, somewhat resembling the larva of the genus *Darapsa*, the first segments a little retractile. Green, with a white ocelliform lateral mark, black pupilled, on the third segment, and a transverse white band; a band of pale green between the fourth and fifth segments, and an oblique whitish-green stripe on the eighth and ninth; an irregular triangle on the lower half of the tenth segment, and the anal segment of the same color. Larva feeds on different kinds of *Citrus*. Chrysalis green; whitish-green on the lower part of the abdomen; reddish-yellow on the back.

This description is taken from the figure in the Cat. Lep. Mus. E. I. Co., and illustrates the preparatory stages of a Javanese variety.

"This butterfly is very active, and difficult to catch, flying in and out of deep forest shades with great velocity, and generally high."—*Capt. Mortimer Slater's "Notes,"* p. 420.

5. **Pap. Antiphus**, Fab.

Pap. Antiphus. Fab., Syst. Ent. III. i. p. 10. n. 28. (1793).

Donovan, Ins. India, t. 15, f. 2. (1800–1803).

Godt. Encyc., IX. p. 71. n. 129. (1819).

Boisd., Sp. Gén. I. p. 266. n. 89. (1836).

E. Doubled., Cat. Brit. Mus. Pt. I. p. 9. (1844).

Diurnal Lepidopt., I. p. 9. n. 21. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 11. n. 37. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 12. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 94. n. 191. (1857).

Pap. Polygius, Godt. Encyc. IX. Sup. p. 8. n. 11. 129–130. (1823).

♀ *Pap. Antiphus*, De Haan, Verh. Nat. Gesch. p. 49. t. 8. f. 2. (1839).

♀ *Pap. Theseus*, Cram., II. t. 180. f. A. B. (1776).

Herbst, Pap. t. 14. f. 3. (1784).

Fab. Ent. Syst. III. i. p. 2. n. 4. (1793).

Esper. Ausl. Schmett. t. 36. f. 3. (1801).

Godt. Encyc. IX. p. 71. n. 127. (1819).

Boisd., Sp. Gén. I. p. 276. n. 99. (1836).

Diurnal Lepidopt. I. p. 11. n. 63. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 11. n. 37. (1852).

Cat. Lep. Mus. E. I. Co., I. p. 95. n. 191. (1857).

♀ *Menelaides Theseus* Hübn., Verz. bek. Schmett. p. 84. (1816).

Male.—Thorax black, a red collar on the prothorax, a row of red points below, at the base of each wing; abdomen red, a dorsal macular black band, the spots diminishing in size from the base, and a row of transverse black spots underneath. Antennæ and legs black.

Wings, upper surface deep black, the fore wings marked with cine-

reous rays, an obsolete row of six red lunules, the last of which only is visible, and a red anal point. Below, the fore wings are light brown, striated with whitish-gray; the secondaries deep black, with six marginal lunules, and a waved red line confluent with the anal spot, extending from the middle of the interior margin to the extremity of the discoidal cellule. Expanse 3.75 inches.

Female.—The same as the male with the exception of the white rays on the under side of the fore wings, which are dark brown, striate with black, and all the angles of the wings are much more rounded. Expanse 3.90 inches.

Hab.—Philippines, (In my collection.)

Java, (Coll. Brit. Mus.)

Var. α . ♂. *Pap. Kotzebue*. Eschsch., Voy Kotzebue, t. 1. f. 2. (1830).

♂. *Pap. Antiphus*. De Haan, Verh. Nat. Gesch. p. 5. p. 40. (1839).

Diurnal Lepidoptera, I. p. 9. n. 21. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 11. n. 37. (1852).

Cat. Lep. Mus. E. I. Co., I. p. 95. n. 191. (1857).

Hab.—Java, (Coll. E. I. Co.)

“Manilla,” Eschscholtz.

Var. β . ♂. *Pap. Antiphus*. G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 11. n. 37. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 12. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 95. n. 191. (1857).

“With short caudal appendages, that are of equal width throughout their length.”—G. R. Gray.

Hab.—Borneo, (Coll. Brit. Mus. and Mus. E. I. Co.)

6. *Pap. Alcinous*, Klug.

Pap. Alcinous. Klug, Neue Schmett. p. 1. t. 1. (1836).

De Haan, Verh. Nat. Gesch. p. 26. (1839).

Diurnal Lepidoptera, I. p. 9. n. 19. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 12. n. 45. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 14. (1856).

Cat. Lep. Mus. E. I. Co. I. p. 95. n. 193. (1857).

Hab.—“Japan”—Siebold.

Var. α . *Pap. Alcinous*. G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 12. n. 45. t. 4. f. 2.

♂. f. 3. ♀. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 14. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 96. n. 193. (1857).

“*Male*.—The primary wings brownish-black, glossed with purple, having streaks of darker color between the nervules and in the discoidal cell. The secondary wings brownish-black, having the base glossed

with purple, with four lunes along the outer margin of a red color with scattered black scales.

"The under surface of the primary wings is pale brownish-black, with streaks of darker color between the nervules and in the discoidal cell. The under surface of the secondary wings is deep brownish-black, with five rosy red lunes along the outer margin; and at the anal angle there is an abbreviated broad band of rosy red, which is paler in part. Expanse 4.60 inches.

"*Female*.—The primary wings pale hair-brown, with a purplish gloss, and the anterior and outer margins brownish-black; the discoidal cell and the spaces between the nervules are marked with black streaks.

The secondary wings pale hair-brown, with a satiny gloss at the base, while posteriorly they are black with a velvety appearance; five narrow lunes of pinkish white, with scattered black scales, run along the outer margin, those towards the anterior angle decreasing in size.

"The under surface of the primary wings is pale hair-brown, slightly tinged with purple, with the streaks as seen on the upper side. The under surface of the secondary wings is entirely black, more or less with a velvety appearance; six rosy red lunes are placed along the outer margin, and at the anal angle there is a large spot of the same color.

"This species is called 'Chentih' by the Chinese."—*G. R. Gray*.

Hab.—China, (In my collection.)

Northern China, (Coll. Brit. Mus.)

Bootan, (Coll. E. I. Co.)

Larva; I have described from fig. 6, Plate II. Cat. Lep. Mus. E. I. Co., which was copied from De Haan's published drawing.

Fawn color, deepest on the back, a transverse reddish brown band on the third segment, with a red ocellus at each extremity; a lateral black band, rising upwards between the fourth and fifth rings and uniting across the dorsum; a transverse oblique band on the eighth and ninth segments, and another between the anal and preceding ring. Below the lateral line, brown; stigmatae pale fawn encircled with black, the first three are round, the remainder oblong.

7. *Pap. Bianor*, Cram.

Pap. Bianor. Cram., II. t. 103, f. c. (1776).

Fab. Ent. Syst. III. i. p. 1. n. 2. (1793).

Esper. Ausl. Schmett. t. 35, f. 2. (1801).

Boisd., Sp. Gén. I. p. 205. n. 17. (1836).

De Haan, Verh. Nat. Gesch. p. 28. t. 5. f. 1. ♂ . f. 2. ♀ . (1839).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 3. (1844).

Diurnal Lepidoptera, I. p. 11. n. 45. (1846).

G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 16. n. 64. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 20. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 110. n. 220. (1857).

Achillides Bianor. Hübn., Verz. bek. Schmett. p. 85. (1816).

Papilio Paris ♀. Godt. Encyc. IX. p. 67. n. 116. (1819).

Wings thickly sprinkled with golden green atoms, brown, the atoms becoming blue on the anterior margin of the wings and the tail. The outer margin divided by lunules, of which the three or four interior ones are violet, and the others formed by blue atoms; the anal eye as in the similar species. Posterior nervules of the fore wings clothed with long brown hairs.

Under surface, base of anterior wings brown, outer half, whitish-gray, nervules and eight longitudinal striæ between them, brown. Posterior wings deep brown; base of both pair of wings powdered with green atoms.

Six lunules on the outer margin, reddish brown, each containing a violet arc; a large reddish-brown anal spot containing a large black pupil, having a violet ray above it. Emarginations, above, white; below, white with a little fulvous. Expanse $5\frac{1}{2}$ inches.

The female does not essentially differ from the male.

Hab.—China, (In my collection.)

China, (Coll. Boisd.)

Northern India, China, (Coll. Brit. Mus.)

Northern India, (Coll. E. I. Co.)

8. **Pap. Ganessa**, E. Doubleday.

Pap. Ganessa. E. Doubled., Gray's Zool. Misc. p. 73. (1842).

“ List. Lep. Brit. Mus. Pt. I. p. 4. (1844).

Diurnal Lepidopt. I. p. 11. n. 48. (1846).

G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 16. n. 66. t. 3. f. 5. ♂ . (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 20. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 108. n. 214. (1857).

Pap. Arcturus. (Westw.) Erichs. Wieg. Archiv. für. Naturg. II. p. 248. (1843).

Male.—“ Above: All the wings black, irrorated with golden green atoms; anterior wings, with the termination of the radial and of the first branches of the median nervures, clothed with a cottony down;

cilia white; posterior wings glossed anteriorly with blue; this portion irrorated with blue atoms; near the external angle is a large brilliant blue patch, slightly sinuated anteriorly, deeply so posteriorly, not connected by any sinuous line with the abdominal margin; near the margin is a series of from three to five red lunules, the one at the anal angle divided by, the others margined with, a slender light blue line; indentations margined with white; tail broad, spatulate irrorated with green along the nervure.

"Below: anterior wings black at the base, whitish beyond the discoidal cell; the nervures, eight longitudinal striæ between the nervures, and the margin itself, fuscous; posterior wings black, more intense than above, irrorated over the basal half, and sometimes beyond, with whitish atoms; near the margin is a series of six red lunules, each divided longitudinally by a slender light blue line; indentations margined with white, a little fulvous at the base; anal angle with an imperfect ocellus, of which the pupil is black, the iris red, marked with a blue crescent.

"Head, thorax and abdomen, black, irrorated with golden green. (Exp. alar. 5 unc.)"—*E. Doubleday*.

"Most probably only a variety of *Pap. Polycitor*, Boisd."—*G. R. Gray*.

Hab.—Philippines, (In my collection.)

Northern India, (Coll. Brit. Mus.)

Northern India, Darjeeling, (Coll. E. I. Co.)

Var *a. Pap. Ganessa*, *E. Doubleday*.

Pap. Aliacmon, Boisd. MSS.

Hab.—Northern India, (Coll. Brit. Mus.)

9. *Pap. Paris*, Linné.

Pap. Paris. Clerck Icones, t. 13. f. 1. (1759).

Linn. Syst. Nat. II. p. 745. n. 3. (1767).

Drury, I. t. 12. f. 1, 2. (1770).

Cram., II. t. 103. f. A. B. (1779).

Herbst, Pap. t. 14. f. 1, 2. (1784).

Fab. Ent. Syst. III. i. p. 1. n. 1. (1793).

Donovan, Ins. China, t. 23. (1798).

Esper. Ausl. Schmett. t. 2. f. 1. (1801).

Godt. Encyc. IX. p. 67. n. 116. (1819).

Boisduval, Sp. Gén. I. p. 208. n. 22. (1836).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 4. (1844).

Diurnal Lepidopt. I. p. 11. n. 52. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 17. n. 68. (1852).

Nat. Library, XXXI. Duncan, p. 102. t. 3. f. 2. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 21. (1856).

Cat. Lep. Mus. E. I. Co. p. 107. n. 213. (1857).

Achillides Paris. Hübn., Verz. bek. Schmett. p. 85. (1816).

Upper surface, brownish black, irrorated with golden green atoms; some of these are grouped together near the extremity of the inner margin of the anterior wings, forming transverse fasciæ, sometimes obsolete.

Posterior wing, with a brilliant azure blue spot, sinuated posteriorly, near the anterior angle and connected with the abdominal margin, by two lines of condensed green atoms, the space between which is sometimes devoid of green atoms, and enclosing at the anal angle, an ocellate spot having a reddish brown iris, surmounted by a very narrow violet arc; tail black and spatulate; indentations, white, on the hind wings.

Below: brown, base of the wings irrorated with greenish-white atoms, a grayish-white transverse band, divided by the black nervures, on the apical half of the anterior wings; more or less distinct in different specimens. Posterior wing with a marginal row of seven ocelliform spots; usually, all are imperfect except the anal, though sometimes the second is also complete; these have a yellowish-red iris divided anteriorly by a slender violet arc; body black, powdered with particles, in the same manner as the wings.

Female.—Differs only in the ground color being a little darker, and in having, on the superior wings, a transverse ray of condensed particles, which reaches from the internal margin almost to the middle. Expanse 3.88—4.56 inches.

Hab.—Philippines, China, (In my collection.)

China, (Coll. Boisd.)

China, Northern India, (Coll. Brit. Mus.)

Cherra Poonjee, Darjeeling, N. India, Canara, (Coll. E. I. Co.)

The *Larva* is probably very similar to that of *Pap. Arjuna*, which will be described in its proper place.

10. *Pap. Arjuna*, Horsfield.

Pap. Arjuna. Horsfield, Cat. Lep. Mus. E. I. Co. t. 1. f. 4. (1828).

Boisd., Sp. Gén. p. 209. n. 23. (1836).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 4. (1844).

Diurnal Lepidopt., I. p. 11. n. 53. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 17. n. 67. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 21. (1856).

Cat. Lep. Mus. E. I. Co. I. p. 107. n. 212. (1857).

Pap. Paris. var. Godt. Encyc. IX. p. 67. n. 116. (1819).

Pap. Paris. Zinken-Sommer. Nova Acta Acad. Nat. Cur. XV. p. 142. (1831).

Much the appearance of *Pap. Paris*. Expanse 4.38 inches. The shining spot is much larger, more sinuated posteriorly, nearly touching the outer margin, and produced interiorly in a point, reaching almost to the abdominal margin. The violet arc in the iris of the anal ocellus is much more distinct than in *Paris*; tail, much less, and the large brilliant patch on the hind wings, has a changeable green tinge; indentations, yellowish-white.

Below, the transverse fasciæ of the fore wings are not so broad, and become yellowish. Hind wings have the violet arcs of the marginal ocellate spots much larger, and situated anterior to, instead of within the iris, as in *Paris*.

Hab.—Java, (Coll. Boisd: Brit. Mus.: E. I. Co.)

Var. *a.* *Pap. Arjuna.* Horsf.

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 17. n. 69. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 21. (1856).

“Larger in size, and more distinctly spotted with golden green, and without the line that runs along the outer margin of the primary wings.”—*Gray*.

Hab.—Java, (In my collection.)

Borneo, (Coll. Brit. Mus.)

Larva: “Feeds on a species of *Citrus*, December.”—*Horsf.*

Pea green, covered with bluish-white spots; a lateral white line extending from the head to the middle of the fourth segment, uniting across the back at each extremity; a bright red spot near this line, on the third segment; a transverse black line edged with blue between the fourth and fifth segments; pale blue transverse lines, between each of the following rings, uniting with a sub-lateral line of the same color; four oblique transverse bluish-white lines, bordered inferiorly with reddish-brown on the five terminal segments, the first extending through two segments. Length about 2—2.25 inches.

Pupa greenish; wing-cases outlined with red; some red spots on the breast; much curved; head bifid.

The description of both Larva and Pupa I have taken from the figures in Cat. Lep. Mus. E. I. Co. I. t. 3. f. 7. 7a.; so that if incorrect, the fault is not in the descriptions, but in the figures, from which they were made.

11. *Pap. Lorquini*, nov. sp.

Female.—Body dark brown; thorax powdered with golden green atoms.

Fore wings dark brown, thickly sprinkled with light yellowish-green dots; a broad, sub-marginal light brown band, near the exterior margin, of equal width throughout its entire length; the brown space, between it and the margin, containing no greenish atoms; indentations whitish.

Hind wings, black, irrorated with shining particles; those on the anterior portion, blue; on the posterior, bright green; a marginal row of six large lunules, and an anal ocellus; the two upper, violet blue; the four following, reddish-brown, each containing an indistinct violet arc; anal eye of the same color, but fulvous posteriorly; tail, broad, spatulate, a few scattered blue atoms; emarginations, white, very small, excepting the two nearest the anal angle, which are very large, and yellow. Expanse 4.81 inches.

Below, brownish-black, base of the wings powdered with greenish-white atoms; a grayish sub-marginal band on the fore wings, corresponding in position to that above, but much narrower; hind wings having six reddish-brown sub-marginal lunes, the first of which is a quadrant; the three following very irregular, being recurved exteriorly, and the fifth and sixth confluent with each other, the last touching the anal ocellus, which is the same as above; indentations very large, fulvous, edged with white on the margin.

Hab.—Philippines, (In my collection.)

I take pleasure in naming this fine species after Mr. E. F. Lorquin, who sent it to me as the female of *Paris*, but from which it is entirely different. Its nearest ally is *Pap. Bianor*, but it is separated from this by the transverse band on the fore wings, both above and below, by the style of irroration in the hind wings, by its lunules, and by the small size, and color of the emarginations; below, by the sub-marginal lunules and the indentations; and by the want of those brown hairs on

the posterior nervules of the fore wings, found upon the upper surface of *P. Bianor*.

12. **Pap. Palinurus**, Fabr.

Pap. Palinurus Fab. Ent. Syst. III. i. p. 5. n. 12. (1793).

Godt. Encyc. IX. p. 66. n. 112. (1819).

Boisd., Sp. Gén. I. p. 207. n. 21. (1836).

De Haan, Verh. Natural Gesch. p. 28? (1839).

Guérin. Rev. Zool. t. 1. f. 2. (1840).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 4. (1844).

Diurnal Lepidopt., I. p. 11. n. 51. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 17. n. 70. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 21. (1856).

Pap. Crino. p. Godt. Encyc. IX. p. 66. n. 113. (1819).

Boisd., Sp. Gén. I. p. 207. n. 20. (1836).

Pap. Regulus Stoll, t. 41. f. 1. 1b. (1791).

Laertias Regulus Hübn., Verz. bek. Schmett. p. 84. (1816).

Upper surface brown, densely powdered with shining green atoms, within, a continuous bluish-green transverse band, broad, and extending from the middle of the costal margin of the anterior wings to the anal margin of the posterior wings; on the primaries, it gradually widens towards the inner margin; on the secondaries, it is widest in the middle, tapering towards the extremities; beyond this band, on the fore wings, the green atoms become fewer, and there are none on the hind wings save a submarginal row of five crescents, composed of very bright green atoms, the first of these in some specimens is partly whitish; a large white lune at the outer angle; anal spot ferruginous, the upper part of the iris separated from a black arc by some green atoms. Indentations white; that on the anal margin, fulvous. Expanse 4.13 inches; tail brown, spatulate.

Below, brown, irrorated with greenish-white dots, outer half of fore wings ash-gray; a marginal cinereous band on the hind wings, containing a large white lunule, having a black spot immediately posterior to it; five oblong reddish brown spots, each compressed between two deep black lines, the upper of which lines is irrorated by an arc of blue atoms, more or less distinct; and an anal ocellus, the pupil of which is black, the upper part of the iris reddish, surmounted by some blue atoms and a black spot, and the lower part, fulvous; the first sub-marginal oblong spot has sometimes a white mark above it.

Hab.—Philippines, (In my collection.)

“India,” (G. R. Gray.)

“Tranquebar,” (Fabricius.)

13. **Pap. Helenus**, Linné.

Pap. Helenus. Clerck, Icon. t. 13. f. 2. (1759).*

Linn. Syst. Nat. II. p. 754. n. 4. (1767).

Cram. II. t. 153. f. A. B. (1779).

Herbst, t. 14. f. 2. (1784).

Fab. Ent. Syst. III. i. p. 2. n. 3. (1793).

Esper, Ausl. Schmett. t. 2. f. 2. (1801).

Godt. Encyc. IX. p. 68. n. 117. (1819).

Lucas, Pap. Exot. p. 24. t. 15. f. 2. (1835).

Boisd., Sp. Gén. I. p. 211. n. 25. (1836).

De Haan, Verh. Nat. Gesch. p. 30. (1839).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 4. (1844).

Diurnal Lepidoptera, I. p. 11. n. 57. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 18. n. 77. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 23. (1856).

Cat. Lep. Mus. E. I. Co. I. p. 101. n. 205. (1857).

Achillides Helenus. Hübn., Verz. bek. Schmett. p. 85. (1816).

Upper surface, brown-black; some dark longitudinal rays visible in the discoidal cellule, and towards the extremity of the superior wings. Inferior wings with a large white spot near the outer angle, rounded within, indented externally, and divided by two nervules into three unequal parts; a red anal lunule, more or less indistinct; tail large, black and spatulate; crenulations white. Expanse 5.31 inches.

Below, a row of sub-marginal oblong grayish-white dashes on the fore wings; the hind wings have, in addition to the large white spot, a marginal row of seven spots, rusty red, of which the five outer are lunulate, the two inner ocelliform; that at the anal angle is confluent at its upper extremity with a lunule of the same color, both being crossed by a violet ray. Body black, studded with white points.

* In order to guard against the possibility of any supposition that I have erroneously assigned to Linné, species belonging to Clerck, in this, and other instances, I must state that the precedence given him in the synonymy, is in the order of the date, and not due to any priority of nomenclature; for though he figured the species, their methodical classification was reserved, intact, for Linnæus.

Hab.—Philippines, (In my collection.)

Northern India, China, (Coll. Brit. Mus.)

China, Java, Sumatra, (Coll. Boisd.)

Java, Darjeeling, (Coll. E. I. Co.)

The following descriptions of the Larva and Pupa are taken from Plate III. f. 2. 2a. Cat. Lep. Mus. E. I. Co., illustrative of the species from Canara, where they were discovered by S. N. Ward, Esq.

Larva, three inches long; dark green above, brownish below; a short transverse light green band on the third segment, marked with some irregular black lines, and having a pink ocellus, the pupil of which is black, at each end; a transverse brownish line, extending clear across the back on the fourth segment, containing some dark brown spots; an irregular oblique transverse white band on the seventh and eighth segments; on the ninth segment an irregular transverse white line, having, when viewed laterally, the appearance of an L with its base turned in the opposite direction; anal segment partly white.

Chrysalis, very much curved, head bifid; wing cases dark brown, with black lines; lower part of abdomen, reddish; above, bluish, with some prominent reddish-brown points; thorax, yellowish-red.

Lucas' figure of the imago is without a tail.

14. *Pap. varasi*, nov. sp.

Upper surface, blackish-brown; five deep black rays in the discoidal cellule; hind wings with a large white spot towards the outer angle, as in *Helenus*, but is divided by three nervules into four unequal spots; two bright ferruginous lunules, one on the abdominal margin, the other in the next interspace near the exterior margin; indentations white, narrow; tail black, spatulate, not so large as *Helenus*. Expanse 4.75 inches.

Under surface brown-black; transverse grayish fasciæ on the fore wings, as in the analogous species; discoidal cells on both anterior and posterior wings are striated with whitish rays; the nerves, also, near the base, are white; base of posterior wings powdered with grayish atoms; a sub-marginal row of seven whitish and fulvous spots and lunules, each preceded by a large lunate indentation on the margin, all white excepting the two last, which are slightly fulvous and united to the sub-marginal spots; that at the anal angle is reddish-brown, very

large, and united with another lune, still larger, separated from the large white spot by one interspace only; these two lunes contain a common violet ray; the first sub-marginal spot is a round whitish dot, the the three following, oblong dashes, and the three terminal, lunules.

Body black, prothorax pointed with white.

Hab.—Philippines, (In my collection.)

Closely allied to *Pap. Iswara*, White, but is considerably smaller.

15. **Pap. Pammon**, Linné.

Pap. Pammon. Clerck, Icon. t. 14. f. 2. ♂. (1759).

Linn. Syst. Nat. II. p. 746. n. 8. (1767).

Cram., II. t. 141. f. B. (1779).

Herbst, t. 19. f. 4. (1788).

Fab. Ent. Syst. III. i. p. 7. n. 20. (1793).

Esper, Ausl. Schmett. t. 4. f. 1; t. 40. f. 1. (1801).

Godt. Encyc. IX. p. 74. n. 139. (1819).

Boisd., Sp. Gén. I. p. 272. n. 96. (1836).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 10. (1844).

Diurnal Lepidopt., I. p. 11. n. 62. (1846).

G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 19. n. 82. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 24. (1856).

Cat. Lep. Mus. E. I. Co. I. p. 104. n. 209. (1857).

Lærtias Pammon. Hübn., Verz. bek. Schmett. p. 84. (1816).

Princeps Heroicus Pammon. Hübn., Samml. Exot. Schmett. I. t. 108. (1806).

Upper surface black; a row of small marginal spots, white, increasing in size towards the inner margin, on the fore wings. On the hind wings a narrow macular band, composed of seven white spots; the anal spot, which is sometimes yellowish, is divided by a black nervure, and is followed by a small group of blue atoms. Expanse 3.75—4.13 inches. Body black, some grayish spots on the prothorax and at the base of the wings.

R. Templeton, Esq., states in Ent. Trans. V. p. 44: “The male of *P. Pammon* has a little white mark near the anal angle of the posterior wing; the female, an ocellus resembling that of *P. Polytes*; all the other markings are the same in both (sexes) except in the females, they are larger and longer.” I have failed to perceive this ocellus in my female; perhaps local and climatal influence have had their force in abrogating this distinction; the insects from which he has taken his notes were from Ceylon, mine from China and the Philippines.

Hab.—♂ . Philippines, Java, ♀ China, (In my collection.)
 Indian Archipelago, Asia, (Coll. Boisd.)
 Penang, N. India, China, (Coll. Brit. Mus.)
 Java, N. India, Chusan, (Coll. F. I. Co.)

Var. *a. Pap. Pammon.* G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 19. n. 82. (1852).
Pap. Cyrus. Fab. Ent. Syst. III. i. p. 7. n. 19. (1793).
 Boisd., Sp. Gén. I. p. 273. n. 96. (1836).
Lærtias Cyrus. Hübn., Samml. Exot. Schmett. II. t. 96. (1806—1824).

Boisduval says "this variety differs from the ordinary male in having the marginal lunules on the under surface of the secondaries of a reddish-yellow, instead of white or yellowish."

Pap. Pammon. var Stoll, t. 33. f. 1. 1a. (1791).

"Another variety, in which the fore wings are deprived of the marginal white spots."—*Boisd.*

Hab.—"India," (Fabricius.)

Var. *β. Pap. Pammon.* G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 19. n. 82. (1852).
 Caudal appendages very short

Hab.—Java, (Coll. Brit. Mus.)

Var. *γ. Pap. Pammon.* G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 19. n. 82. (1852).
Pap. Ledebouria. Eschscholtz. Voy. Kotzebue. III. t. 3. f. 7. (1830).
Pap. Ledebourus. De Haan.
Pap. Alphenor. (Boisd.) ♂ De Haan, Verh. Nat. Gesch. p. 41. (1839).

"Superior wings, as in *Pammon* ♂. Inferior wings, without tail, the hindmost tooth being only a little produced; emarginations more white, and larger than in *Pammon* ♂, preceded by a sub-marginal row of small white lunules; the central transverse band a little longer, formed of oval spots. Below, the marginal lunules of greater size; the anal spot colored yellow.

"*Hab.*—Celebes, (Coll. M. Payen.)"—*Boisd.*

"Manilla."—*Eschscholtz.*

Pap. Pammon "at Chusan, was observed from July to September, inclusive."—(Dr. Cantor's Notes.)

"This is the most common species of the genus, being sometimes seen in dozens in the same field at Rajpore, and elsewhere in the Dhoon, during the months of August and September; nor are they uncommon in the glens of the mountains."—Capt. T. Hutton, Trans. Ent. Soc. V. p. 50.

Larva, Cat. Lep. Mus. E. I. Co. I. Plate III. f. 4. 4a. (1857).

Boisd., Sp. Gén. I. p. 274. n. 96. (1836).

Dark green; a narrow transverse band on the third segment, marked with white, and having a round black spot at the extremity; a grayish-brown transverse band on the fourth, uniting with the brown of abdomen below. An oblique transverse brown band on the seventh and eighth segments; another, incomplete on the ninth ring, above which there is a round spot; length about 1.75 inches.

Pupa, much curved; head, bifid; some spinous processes on the back, grayish-brown, marked with black and a little brown.

Larva "feeds on a species of *Citrus*, bearing the native name of *Juruk*, November to April."

"NOTE.—Every variety of *Juruk* or Orange (*Gulog*, *Kina*, *Pichet*, &c.) produces a different butterfly, although scarcely any difference appears in the caterpillar."—*Horsfield*.

"Larvæ particularly destructive to the lime trees in Ceylon, as are also those of *P. Polymnestor*, *Polydorus* and *Hector*."—*R. Templeton, Esq.*

16. *Pap. Polytes*, Linné.

Pap. Polytes. Clerck, Icon. t. 14. f. 1. (1759).

Linn. Syst. Nat. II. p. 746. n. 5. (1767).

Cram., III. t. 255. f. A. B. C. (1782).

Herbst, t. 15. f. 2 ♀. t. 20; f. 3, 4 ♂. (1784).

Fab. Ent. Syst. III. i. p. 2. n. 5. (1793).

Esper, Ausl. Schmett. t. 3. f. 1; t. 12. f. 1. (1801).

G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 20. n. 83. (1852).

" List. Lep. Br. Mus. Pt. I. p. 25. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 103. n. 208. (1857).

Menelaides Polytes. Hübn., Verz. bek. Schmett. p. 85. (1816).

Menelaides Alphenor. pt. Hübn., Verz. bek. Schmett. p. 85. (1816).

Princeps Heroicus Stichius. Hübn., Samml. Exot. Schmett. I. t. 3. (1806).

Pap. Pammon. ♀ Boisd., Sp. Gén. I. p. 272. n. 96. (1836).

De Haan, Verh. Naturl. Gesch. p. 41. (1839).

E. Doubled., List. Lep. Br. Mus. Pt. I. p. 11. (1844).

Diurnal Lepidoptera, I. p. 11. n. 62. (1846).

Wings, blackish-brown. Primaries light brown on the outer half, divided by longitudinal dark rays; exterior margin dentate; indentations white.

Secondaries have a large white or yellowish-white spot in their middle, palmated and divided by the nervules into three, four or five parts.

of which the two inner are more or less confluent posteriorly, with an oblong spot of reddish-brown situated upon the anal margin; six sub-marginal lunes, reddish-brown; an anal oblong mark of the same color, containing a round black dot; all the red parts irrorated with violet atoms; indentations reddish-yellow and whitish; expanse 4.25—4.38 inches; tail short, blackish, spatulate.

Below, as above, the sub-marginal lunules sometimes preceded by small groups of violet atoms.

Body brownish; prothorax pointed with white, and some white spots at the base of the wings and insertion of the abdomen; two lateral white lines, enclosing a row of yellow dots on each side of the abdomen.

Hab.—♂ Philippines, ♀ China, (In my collection.)

Indian Archipelago, Asia, (Coll. Boisd.)

♂ ♀ Java, Calcutta, N. India, Chusan, (Coll. E. I. Co.)

China, Ceylon, N. India, Java, Gulf of Martaban, N.

China, Sandwich Islands, (Coll. Brit. Mus.)

Var. *a. Pap. Polytes*. G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 20. n. 83. (1852).

Pap. Numa. Weber, Observ. Entom. Kiel. p. 106. (1801).

Pap. Polytes. var. De Haan, Verh. Naturl. Gesch. p. 41. (1839).

Hab.—Indian Archipelago.

In a specimen which I have, from China, there are two rays, composed of violet atoms, extending from each extremity of the sixth sub-marginal lunule to the palmate white spot.

“Not uncommon in the Dhoon during the rainy season, and at Rajpore, at the foot of the Hills, it is frequently met with.” (Capt. T. Hutton.)

“At Chusan, the perfect insect appears during August and September.” (Dr. Cantor’s Notes.)

Larva. Cat. Lep. Mus. E. I. Co., I. t. III. f. 3. (1857).

Not quite so large as that of *P. Pammon*, and light green; transverse bands on the third and fourth segments, as in that species, the second, however, being dark brown; a white stigmated line, bordered posteriorly with brown, and a white oblique transverse line on the seventh and eighth segments. Anterior portion of the body, below the white lateral line, dark brown; posterior segments nearly white, or light brownish-yellow.

“In Java, the larva feeds on a species of *Citrus*, bearing the native name of *Juruk*, from January to May.”—*Horsfield*.

Pupa. Cat. Lep. Mus. E. I. Co., I. t. III. f. 3a. (1857).

Not so much arched as in *Pap. Pammon*; of a greenish brown, mingled with darker spots; prominent processes on all of the abdominal segments, while in *Pammon* they are found only upon the first two rings.

17. **Pap. Alphenor**, Cram.

Pap. Alphenor. Cram., I. t. 90. f. B. (1779).

Esper, Ausl. Schmett. t. 37. f. 1. (1801).

Boisd., Sp. Gén. I. p. 274. n. 97. (1836).

Diurnal Lepidopt., I. p. 12. n. 65. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 20. n. 85. (1852).

Pap. Polytes. var. Godt. Encyc. IX. p. 71. n. 126. (1819).

Menelaides Alphenor. pt. Hübn., Verz. bek. Schmett. p. 85. (1816).

Rather smaller than *P. Polytes*; the longitudinal rays on the outer half of the primary wings of that species become whitish in this, especially towards the internal angle. Inferior wings tailed, long and spatulate; disc contains a white spot, not palmate, divided by very narrow grayish nervures, into four parts; the posterior and inner portions of which are in conjunction with a large reddish-brown spot, divided into three parts by black nervules; that on the anal margin containing a large round black dot; the middle one is much the longest, touching inferiorly the last of a row of six sub-marginal reddish-brown lunules, which are rather larger than those of *Polytes*; indentations of both anterior and posterior wings white, excepting the anal, which is a little fulvous; expanse 4.13 inches; the red parts near the anal margin are powdered with violet atoms.

Below, the same as above, but the white indentations on the posterior wings are much larger and fulvous at the base. Body, the same as *Polytes*, with the addition of a ventral white band.

Hab.—♀ Philippines, (In my collection.)

“Celebes, (Coll. M. Payen.)”—*Boisd.*

“Amboina.”—*Cram.*

“China?” Cat. Lep. Brit. Mus.

Boisduval says, it is not tailed, but that the posterior wings are simply produced in a short tooth. This is, then, either a sexual distinction, or the tail was excised in the specimens which he examined, for in mine, which agrees with his description in every other particular, it is not only very distinct, but also a little longer than that of *Pap. Polytes*.

18. **Pap. Demoleus**, Linné.

Pap. Demoleus. Roesel, Ins. Add. t. 1. f. 2, 3. (1746).*

Linn. Syst. Nat. I. p. 753. n. 46. (1767).

Cram., III. t. 231. f. A. B. (1782).

Fabr. Ent. Syst. III. i. p. 34. n. 101. (1793).

Herbst, Pap. t. 36. f. 3, 4. (1796).

Donov., Ins. China, Pl. 29. f. 1. (1798).

Pal. de Beauv. Ins. Afr. et. Amer. t. 2. b. f. 2. (1805).

Godt. Encyc. IX. p. 43. n. 52. (1819).

Boisd. Faune. de Madag. p. 12. (1834).

Lucas, Pap. Exot. p. t. 9. f. 2. (1835).

Boisd., Sp. Gén. I. p. 237. n. 60. (1836).

E. Doubled., Cat. Lep. Brit. Mus. Pt. I. p. 6. (1844).

Westw., Arc. Ent. p. 148. (1845).

Diurnal Lepidoptera, I. p. 12. n. 70. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 21. n. 91. (1852).

Orpheides Demoleus. Hübn., Verz. bek. Schmett. p. 86. (1816).

Princeps dominans Demoleus. Hübn., Samml. Exot. Schmett. I. t. 115. (1806-1824).

Papilio Demodocus. Esper, Ausl. Schmett. t. 51. f. 1. (1801).

Wings black, thickly powdered with yellow atoms; the anterior wings have a number of unequal, irregular and scattered yellow spots on the disc; a double row of yellow marks on the exterior margin, of which the marginal are much the smallest, and are situated upon the indentations; the base and costal margin are marked with yellow points.

Posterior wings are traversed above the middle by a nearly straight yellow line, having an ocellus upon each extremity; that infringing on the costal border is slightly reddish, and surrounded by a blue iris; that on the abdominal margin has the superior half, blue, the inferior, reddish-brown; the outer margin is obtusely dentate, and furnished with the double row of marginal lunules, as in the fore wings; expanse 3.75 inches.

Under surface paler than above, and possessing all its characteristics, with the addition of having the base rayed with yellow.

The posterior wings also present upon a deeper ground color than the rest of the surface, six reddish spots, inwardly edged with blue, of which one is at the extremity of the discoidal cellule; the other five forming an irregular transverse band beyond it, upon the disc. Fol-

* The remarks made upon the synonymy of *Pap. Polytes*, are equally applicable in this and similar cases.

lowing these are the large yellow sub-marginal lunules, separated from the emarginate spots by a series of black arches.

Body black, with a yellow line on each side of the head and thorax; yellow below, with longitudinal black streaks; antennæ black, speckled with reddish towards the club.

Hab.—Cape of Good Hope, Madagascar, (In my collection.)

Cape of Good Hope, Coast of Guinea, Senegal, Madagascar,
(Coll. Boisd.)

South and West Africa, (Coll. Brit. Mus.)

“In Senegal, the larva has been reared upon a *Citrus*.”—*Boisd.*

19. **Pap. Erithonius**, Cram.

P. Erithonius. Cram., III. t. 232. f. A. B. (1780).

Herbst, Pap. t. 36. f. 5, 6. (1796).

Diurnal Lepidopt., I. p. 12. n. 71. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 21. n. 92. (1852).

“List. Lep. Brit. Mus. Pt. I. p. 28. (1856).

Cat. Lep. Mus. E. I. Co. I. p. 105. n. 211. (1857).

Princeps dominans Erithonius. Hüb., Samml. Ex. Schmett. I. t. 116. (1806–1824).

Pap. Epilus. Fabr. Ent. Syst. III. i. p. 35. n. 102. (1793).

Donov., Ins. of China, Pl. 29. f. 2. (1798).

Godt. Encyc. IX. p. 43. n. 53. (1819).

Boisd., Sp. Gén. I. p. 238. n. 61. (1836).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 7. (1844).

Orpheides Epilus. Hüb., Verz. bek. Schmett. p. 86. (1816).

Pap. Demoleus. apud. Esper, Ausl. Schmett. t. 50. f. 1, 4. (1801).

Wings black; primaries thickly dotted with yellow at the base, forming transverse lines; a great number of irregular yellow spots on their middle, scattered and unequal in size; a sub-marginal row of yellow spots; and another row, much less, situated upon the indentations; excepting the first, which is oblong, the spots of the sub-marginal line gradually increase towards the inner angle. These two rows are continued on the secondaries to the anal angle, becoming, however, much larger and more lunate.

A broad transverse yellow band across the upper portion of the hind wings, very irregular posteriorly, and varying considerably in the size, shape and number of the spots; having at either end a colored spot, that on the costal margin being black, (in one specimen I have, dark reddish-brown,) containing a blue arc; that on the abdominal margin bright reddish-brown, with a blue lunule above it, sometimes obsolete.

"The male of *P. Erithonius* is without the blue lunule," not entirely wanting in my specimens. "The female has it; and both sexes vary in having or not having one or two spots outside the closing vein of the discoidal cell of the lower wing; beneath, the markings in both are nearly identical, lunule and all." *

Below, same general markings as above, on the fore wings, but rather paler; base covered with yellowish-white radii; a sinuous line of fulvous atoms near the apex. Hind wings, anterior part, entirely yellowish-white, crossed by a transverse black line, and divided into spots by the black nervures. Posterior portion of wings black, containing in its upper portion six orange spots, margined anteriorly with blue, five forming a sinuous transverse line, and the sixth, a lunule in the discoidal cell; the costal black spot contains a blue lunule, bordered with fulvous inwardly; anal spot the same as above; the sub-marginal lunules and marginal indentations are much larger than on the upper surface; expanse 3.5—3.88 inches.

Body, black above, powdered with yellow atoms, with a yellow line on each side of the head and thorax; below, yellowish.

Hab.—China, India, Phillippines, (In my collection.)

China, Bengal, (Coll. Boisd.)

Canara, Calcutta, Penang, (Coll. E. I. Co.)

Northern India, Penang, Ceylon, (Coll. Brit. Mus.)

"Occurs in the Deyrah Dhoon, and likewise in the Hills during summer. I have received it from Madras, and frequently took it at Nee-much, in Western India." †

This species is subject to considerable variation, even in what is usually considered its normal condition. I have already referred to the differences in the transverse band of the hind wings on the upper surface, and there is also some in the shape and size of some of the spots on the fore wings; but it is on the under surface that we see the greatest variations; the fore wings are comparatively uniform, with the exception that there are two yellow spots near the extremity of the cell, which are sometimes united; on the hind wings there is great difference in the size of the sub-marginal lunules, sometimes being so large as to

* R. Templeton, Esq., Trans. Ent. Soc. V. p. 44. (1847).

† Capt. T. Hutton, Proc. Ent. Soc. V. p. 48. (1847).

give the idea that the wing is yellowish-white, with transverse and sinuate black bands upon it; also in the size of the orange spots, which are sometimes bordered on both sides with blue.

Var. *a. Pap. Erithonius*. G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 21. n. 92. (1852).

Pap. Sthenelus. McLeay, King's Surv. of Aus. App. p. 457. n. 133. (1827).

Boisd., Sp. Gén. I. p. 239. n. 62. (1836).

"This species closely resembles *P. Erithonius*, and is to be distinguished from it only by a large yellow spot near the middle of the inner margin of the fore wings, which in *Erithonius* and *Demolius* is divided into two parts; and by one little yellow spot, joined to the outer edge of the transverse band of the hind wings, whilst in *Erithonius* there are two or three.

"This species replaces *Erithonius* on the west coast of Australia."—*Boisd.*

Hab.—Australia, (Coll. Brit. Mus.)

Var. *β. Pap. Erithonius*. nov. var.

This differs from the normal state in having the upper surface densely powdered with very fine yellow atoms; in the absence of a yellow spot just within the line of the sub-marginal spots; and in the shape of the lower spot in the cell, which has the appearance of an inverted comma. On the hind wings the sub-marginal spots are nearly square; the transverse yellow band is not near so irregular as in the typical condition; the projecting yellow spots are so reduced in size as to be nearly in a straight line, though not so much as in *Pap. Demoleus*; and the reddish-brown anal spot contains, in its upper portion, a deep velvety black round dot, surmounting which there is a light blue lunule.

Below, as on the upper surface, with the addition of a long, fulvous, sinuate band near the apex of the primaries; and that the sub-marginal lines on the secondaries are all united, forming a broad, pale yellow sinuate band.

Hab.—Philippines, (In my collection.)

Larva. Cat. Lep. Mus. E. I. Co., I. p. 106. t. III. f. 6. 6a. (1857).

The Caterpillar feeds upon the Lime Orange, Citron and "Bel" trees, arrives at maturity in the early part of July (1st—8th), and transforms; the imago emerging in from eight to ten days.

"Green, with a reddish or orange colored head; the fourth segment of the body is also bordered with the same color, and there is a lateral

oblique stripe on the hinder parts, which is blackish and edged with white; the spiracles are black; there are two short tentacular horns projecting from the anterior segment and two others from the anal segment, beneath which latter is a whitish stripe, running obliquely forwards and downwards; a white lateral stripe above the legs, which are yellowish."*

"Very common throughout the Bengal presidency; the larva has two processes (above the head) very pliable and completely retractile. The scent of these processes is that of very rotten oranges, and is overpowering in the extreme, and does not leave the hand, when once infected, for many hours, even after several washings. The larva, when touched, shrugs up its head, and only displays the nauseous filaments when much or repeatedly irritated, and then it endeavors to smear the irritating body by dragging them over and about it."†

"The eggs are laid singly on the tips of the leaves, and generally on the upper side. The larva is at first of a greenish brown."—*Mrs. Hamilton*.

This description is so very different from that given by Fabricius, and from the drawings of Esper, and that in the *Cat. Lep. Mus. E. I. Co.*, that I shall append all three, leaving to future investigators the task of discovering which corresponds to the true larva of this species.

"Yellowish-green, with the head brick-red, and two short horns at the extremity of the body."—*Fab.*

"Caterpillar of a reddish color, with the openings upon the middle of a pale yellow, pointed with black; that which separates the fourth from the fifth segment is black, embroidered with yellow; beyond this there are some very obscure marblings on the side, and a red ocellate spot on the middle of the third segment.—*Esper.*"—*Boisd.*

The figures from which the following description is taken, were drawn from Larvæ and Pupæ, discovered in Madras by S. N. Ward, Esq., whose accuracy in entomological delineations is well known.

Dark green; head brownish; a white lateral stripe above the legs, which are also brownish; a short transverse line on the third ring, brownish, pointed with red; and another at the end of the fourth seg-

* Capt. T. Hutton, *Proc. Ent. Soc. V.* p. 48. (1847).

† Capt. Mortimer Slater, MS. "Notes," p. 438.

ment, of the same color, serrated anteriorly; stigmatae red; anal segment slightly furcated at its extremity.

Pupa grayish-brown, with darker lines, more especially on the abdominal segments and on the prothorax; wing cases shaded with black.

20. **Pap. Horsfieldii**, nov. sp.

Upper surface black; a row of white marginal spots, increasing in size towards the inner angle. Secondary wings have a broad transverse macular white band on the disc, composed of seven spots; that on the anal margin being somewhat yellow; indentations white, narrow; expanse 4.25 inches.

Under surface of fore wings same as the upper; the hind wings have, in addition to the macular transverse band, which is here entirely white, a small fulvous lune on the abdominal margin, just below the last spot of the band; and a sub-marginal row of oblong white dashes, preceding the white indentations.

Body black; thorax beneath marked with white spots.

Female differs in having the anal lunule bright red, surmounted by a narrow violet line; a group of white atoms posterior to the sixth macular spot; and in having the sub-marginal spots and lunules, yellowish; expanse 4.39 inches.

Hab.—Philippines, (In my collection.)

Allied to *Pap. Phestus*, Boisd.

I take pleasure in naming this species after Thomas Horsfield, Esq., who has contributed almost all the knowledge that we possess of the metamorphoses of eastern exotic Lepidoptera, by his indefatigable exertions in that most difficult and tedious branch of Lepidopterology.

21. **Pap. Erectheus**, Donovan.

Pap. Erectheus. Donovan. Ins. New Holl. Pl. 15. (1805).

Godt. Encyc. IX. p. 31. n. 15. (1819).

Lucas, Pap. Exot. p. 17. t. 9. f. 1. (1835).

Boisd., Sp. Gén. I. p. 215. n. 31. (1836).

E. Doubled., Cat. Lep. Brit. Mus. Pt. I. p. (1844).

Diurnal Lepidopt., I. p. 12. n. 77. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 22. n. 99. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 29. (1856).

Nestorides Erectheus. Hübn., Samml. Exot. Schmett. II. t. 108. (1806—1824).

♀ *Pap. Ægeus*. Donovan., Ins. New Holl. Pl. 14. (1805).

Godt. Encyc. IX. p. 31. n. 17. (1819).

Nestorides Ægeus. Hübn., Samml. Exot. Schmett. II. t. 107. (1806—1824).

♂ ♀ *Pap. Gambrisius*. De Haan, Verh. Nat. Gesch. p. 30. (1839).

Male.—Anterior wings black; a transverse yellow band near the apex, composed of six spots, of which the first two are small oblong dashes on the costa, at about two-thirds its length from the base, the three following irregular, and the sixth, just above the middle of the outer margin, is sagittate; beyond this band, longitudinal lines are produced to the outer margin, of fine yellow atoms; indentations white.

Posterior wings black, with a broad greenish-gray band on the disc, partially divided by the black nervules, and very deeply indentate exteriorly; abdominal margin marked with a brick-red spot, containing a violet arc; below the anal sections of the transverse band, some fine blue atoms, forming two nearly obsolete arcs; indentations white; expanse 4. inches.

Body brown; some yellow spots on the prothorax, and the first joint of the palpi.

Below, the fore wings colored as above, with the addition of another spot to the apical band, the spots of which are also larger. On the hind wings there are three rows of lunules: the first, sub-marginal, contains seven lunes, those on the costal and anal margin being much the largest, the others gradually enlarging towards the costal margin; the anal contains a violet arc: the second row is composed of six, formed of blue atoms, of which the three nearest the costa are sometimes obsolete; the third of six of the same color as the transverse band above, of which the two central are very large. Indentations not so long as on the upper surface.

Female.—Basal half of fore wings dark blackish-brown; exterior half grayish-white, shading into dark brown along the costa and outer margin, and traversed by dark nervules and longitudinal lines, the latter on the apical half only; wings sinuate, slightly dentate, the indentations occupied by semi-lunes, white, becoming fulvous towards the inner angle; extremity of the discoidal cell marked with a large black crescent.

Hind wings blackish-brown, a central transverse band of pure white, widest in the middle, and tapering towards either margin. Posterior to this, three rows of lunules; the first, large, are formed of blue atoms, of which the two nearest the abdominal margin are the only constant ones, the others being most frequently obsolete; these are followed by a row of six large blood-red lunes; and those of the third row are situ-

ated on the indentations, fulvous, bordered with white exteriorly; between the fourth and fifth indentations, the wing is produced into a short, obtuse, rounded tooth; an anal spot, blood red, surmounted by a violet blue arc; expanse 5.88 inches.

Below, the fore wings as above; the hind wings have the blue lunules, complete, the red and marginal crescents also much larger; that one of the latter situated on the anal indentation, rises as a short fulvous dash into the first median interspace; nervules, traversing the central white band, black.

Body black; yellow spots on the prothorax, first joint of palpi yellow; abdomen underneath rayed with yellow; anus, fulvous.

Hab.—Australia, (In my collection.)

Australia, (Coll. Brit. Mus.)

Australia, (Coll. Boisd.)

“Australia, (Coll. Lacordaire.)” Boisd.

“New Guinea, (Coll. Jarden des Plantes.)” Boisd.

“Arrou Islands, (Coll. M. Payen.)” Boisd.

Var. *a. Pap. Erectheus*. G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 22. n. 99. (1852).

“List. Lep. Brit. Mus. Pt. I. p. (1856).

With the marginal spots on the under surface of the secondary wings deep orange, and the lunules of blue and buff, fewer in number.

Hab.———? (Coll. Brit. Mus.)

Var. *β. Pap. Erectheus*. G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 22. n. 99. (1852).

Pap. Erectheus. var. Voy. au Pole Sud. Lep. t. 1. f. 1, 2.

The under surface of the secondary wings with only a deep orange spot at the anal angle.

Hab.———?

Var. *γ. Pap. Erectheus*. Boisd., Sp. Gén. I. p. 215. n. 31. (1836).

“Differs in having the red lunules much less, and also preceded by some blue atoms.”—Boisd.

Hab.—“Australia, (Laplace.)”—Boisd.

22. *Pap. Agamemnon*, Linné.

Pap. Agamemnon. Linn. Syst. Nat. II. p. 748. n. 22. (1767).

Herbst, Pap. t. 48. f. 1, 2. (1788).

Fabr. Ent. Syst. III. i. p. 33. n. 98. (1793).

Esper, Ausl. Schmett. t. 46. f. 1, 2. f. 3. var. (1801).

Donovan, Ins. of China, t. 27. f. 2. (1805).

Godt. Encyc. IX. p. 46. n. 63. (1819).

Boisd., Sp. Gén. I. p. 230. n. 49. (1836).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 5. (1844).

Diurnal Lepidoptera, I. p. 14. n. 109. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 27. n. 130. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 37. n. 130. (1856).

Cat. Lep. Mus. E. I. Co., p. 114. n. 229. (1857).

Pap. Agamemnon. Cram., p. 151. fig. as *Pap. Ægistus*. II. t. 106. f. C. D. (1777).

Iphiclides Agamemnon. Hübn., Verz. bek. Schmett. p. 82. (1816).

Wings black, marked with a number of greenish-yellow or sea-green spots, oval or punctiform, excepting those at the base of the secondaries, which are linear and parallel with the axis of the body; of the others, eight are contained in the discoidal cellule of the anterior wings, the outer margin of which is sinuate, and the remainder may be considered as forming two transverse rows upon the disc on both primaries and secondaries; those upon the secondaries being of nearly equal size, but the inner row on the primaries is much the largest, the spots, excepting the two nearest the inner margin, which are again contracted, dilating considerably towards the middle of the disc; the two terminal spots in this line are each divided into two parts, more or less separated by the nervures or a black line, though in some specimens they are confluent. Posterior wings have a short acute tail, varying somewhat in length; indentations white or yellowish.

“Below, brownish, with the greatest part of the spots of a paler hue. On the primaries, the origin of the costal nervure, the middle and apex of the wings, together with the base of the secondaries, are irrorated with reddish-violet; the posterior wings have near the costal edge, a little black spot, preceded anteriorly by a carmine-red lunule, and a little behind this, on the border of the discoidal cell, a similar spot; the middle of a deeper color than the rest of the surface; a red spot in the female only, near the anal angle.

“Body black, with two grayish-green rays upon the thorax and abdomen; white below, with rosy or white hairs upon the breast.”—*Boisd.*

Hab.—Philippines, India, Java, (In my collection.)

China, Bengal, Java, Maluccas, Philippines, (Coll. Boisd.)

N. India, Penang, Gulf of Martaban, Ceylon, Java, Borneo, (Coll. Brit. Mus.)

Java, Silhet, Dukhun, (Coll. E. I. Co.)

Of four specimens which I have, no two exactly resemble each other.

That from India has the spots of a yellowish color, which also differ somewhat in shape from the insular specimens. The male from Java has the two terminal spots of the inner transverse macular band of the primaries entire, whilst in the others they are each distinctly subdivided; the color of the spots is also much deeper than in any of the others; expanse 3.32 inches.

Expanse of Indian specimen 3.75 inches.

Those from the Philippine Islands have the fore wings broader than either of the others, whilst the configuration and color of the the upper surface resembles that from Java, with the exception of the terminal spots, which are here separated. Expanse ♂ 3.35 inches; ♀ 4.19 inches.

Their tails are also longer than in either of the others.

It is on the under surface, however, that we find the greatest difference.

The Indian variety is of a beautiful rich umber brown, nearly the whole of the fore wings covered with a reddish-violet shade; the spots of the same color as above; those of the sub-marginal line obsolete towards the apex, and in common with the hind ones of the second row, white on the inner margin; an oblong black spot on the costa, near the apex. Basal half of posterior wings light brown, having a large white space on the middle of the costal margin, containing, in its upper extremity, a double lunule of carmine and jet-black; immediately behind this, a round white dot, surmounted by an indistinct black lunule; the transverse spots are of a dark greenish-brown, and very obscure.

The Javanese specimen differs in having the ground color darker and more dull; spots on fore wings and base of hind wings bright green; those of the outer row being more distinct.

On the hind wings there are two carmine lunules, and the transverse spots are not so dark.

In those from the Philippines the ground color is very dull, and the spots very plainly marked; scarcely any reddish-violet irrorations. In the ♂ the black lunules on the posterior wings are small, surmounted with fulvous; in the ♀ very large, a rosy lunule above.

Larva. Cat. Lep. Mus. E. I. Co., I. Pl. III. f. 9. 9a. (1857).

"In Java," from a figure of which insular variety the following description is drawn, "it feeds on a species of *Uvaria*, bearing the native name of *Kalak*, December."—*Horsfield*.

"Smooth, slightly attenuated towards the extremities, somewhat arched in the middle," having two projecting points from the anal segment, and a lateral green line, containing the black stigmatae, above which it is yellowish-brown, striped longitudinally with bands of a lighter color; the segments marked also with a number of short oblique transverse brown lines, three sub-dorsal green points on the first three rings. Below the lateral line, pink and fulvous.

Chrysalis brownish, with two greenish lines on the back, uniting towards the head; wing covers outlined in black. Not so much arcuated as in the preceding species.

This species is very common in the Philippines.

23. **Pap. Eurypylus**, Linné.

Pap. Eurypylus. Clerck, Icon. t. 28. f. 2. (1759).

Linn. Syst. Nat. II. p. 754. n. 49. (1767).

Cramer, II. t. 122. f. C. D. (1777).

Herbst, Pap. t. 37. f. 5, 6. (1788).

Fab. Ent. Syst. III. i. p. 20. n. 61. (1793).

Esper, Ausl. Schmett. t. 33. f. 1. (1801).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 28. n. 133. (1852).

" List. Lep. Brit. Mus. Pt. I. p. 38. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 113. n. 227. (1857).

Zetides Eurypylus. Hübner, Verz. bek. Schmett. p. 86. (1816).

" Samml. Exot. Schmett. II. t. 106. (1806—1824).

Pap. Eurypilus. Godt. Encyc. IX. p. 45. n. 61. (1819).

Boisd., Sp. Gén. I. p. 233. n. 54. (1836).

De Haan, Verh. Naturl. Gesch. p. 33. (1839).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 6. (1844).

Diurnal Lepidopt., I. p. 14. n. 113. (1846).

Pap. Jason. Esper, Ausl. Schmett. t. 58. f. 5. (1801).

Upper surface black, traversed by a central pale green band, narrowing at its extremities, and separated on the primaries into spots of unequal size. The discoidal cell of the anterior wings contains four oblong dashes and a spot of the same color; several spots also on the costa, near the apex; a sub-marginal row of sixteen irregular spots, varying in size and form, extends from the apex of the primaries to the anal angle of the secondaries. Fore wings sinuate; indentations of hind wings greenish-white; expanse 3.5—3.63 inches.

Below, brown; the same general arrangement of the markings; the spots, however, becoming larger, of a paler hue, and having a pearly lustre. Those on the fore wings vary somewhat in different specimens,

being sometimes confluent; there are two nacreous dashes inserted between the first, second and third sub-marginal spots on the posterior wings. Six lunulate carmine spots on the hind wings, of which one is situated at the extremity of a short black band, arising on the costa at about one-third its length from the base, and running to the sub-costal nervure; the others are below the transverse band, extending from the first, which is in the lower part of the cell, and is bordered interiorly with a narrow white or fulvous line, to the anal margin, and above the last of which there arises a broad black band proceeding to the costa, and disconnected with the short black band previously spoken of; on the abdominal side of which there is a red line; abdominal margin fringed with white hairs.

Body blackish; greenish-white below, with two subdorsal whitish lines on the black part of the abdomen.

Female?—Expanse 3.63 inches. Browu; transverse band and spots pale yellowish-green on the primaries, greenish-white on the secondaries; the two black bands are united near the base of the secondary wings on both surfaces, enclosing underneath a lemon-yellow patch; the base is also yellow; the red spot near the costal margin is very small; five red lunate marks below the band, differently shaped from in the male, and the red sub-marginal line is wanting. The nacreous spots are much larger than in the male, increasing on the anterior wings from the inner angle to the apex, and assuming, on the posteriors, the form of very large lunes. Body as in the male.

Hab.—Philippines ♂ . ♀ ? Java ♂ , (In my collection.)

“Amboina, Celebes, Philippines, Papua, (Coll. M. Lacordaire.)” Boisd.

India, N. India, Singapore, Ceylon, Java, (Coll. Brit. Mus.)

Java, Silhet, Northern India, (Coll. E. I. Co.)

Var. *a.* *Pap. Eurypylus*. G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 28. n. 133. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 38. (1856).

Pap. Lycaon. Boisd., MSS.

Westwood, Arc. Ent. II. p. 15. (1845).

Diurnal Lepidoptera, I. p. 14. n. 112. (1846).

“ A new species, very closely allied to *Pap. Eurypylus* of Clerck's Icones, and *Pap. Evemon* of Boisduval.”—Westwood.

Hab.—Australia, (Coll. Brit. Mus.)

Var. β . *Pap. Eurypylus*. G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 28. n. 133. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 38. (1856).

Pap. Eurypylus. var. De Haan, Verh. Naturl. Gesh. p. 33. (1839).

Pap. Evemon. Boisd., Sp. Gén. I. p. 234. n. 55. (1836).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 6. (1844).

Diurnal Lepidopt., I. p. 14. n. 114. (1846).

“ A third less than *Pap. Eurypilus*, which it much resembles. The green band is proportionally larger upon the internal margin of the fore wings; three of the linear dashes in the discoidal cellule are replaced by spots of the same color; abdominal margin of the secondaries furnished with brown hairs. Below, the inferior wings invariably have the red lunule on the costal margin obsolete; the marginal spots of the hind wings much larger than above, and almost cuniform. Otherwise, as in *Eurypilus*.”—*Boisd.*

Hab.—“Java, Sumatra.” Boisd.

——? Borneo, (Coll. Brit. Mus.)

Larva. Cat. Lep. Mus. E. I. Co., I. Pl. XII. f. 10. 10a. (1857).

Greenish-brown; two short tentacular horns on the first segment; anal segment forked as in *Agamemnon*, an ocellus, black and white, upon the third ring; dark stigmatae, and a sub-lateral white line, above the feet, which are yellowish-brown.

Chrysalis; general color greenish, with a strongly developed dorsal protuberance.

24. *Pap. Sarpedon*, Linné.

Pap. Sarpedon. Roesel. Ins. IV. t. 6. f. 1. (1761).

Linn. Syst. Nat. II. p. 747. n. 15. (1767).

Cram., II. t. 122. f. D. E. (1777).

Herbst, t. 10. f. 4, 5. (1784).

Fab. Ent. Syst. III. i. p. 14. n. 41. (1793).

Esper, Ausl. Schmett. t. 8. f. 2. (1801).

Godt. Encyc. IX. p. 46. n. 62. (1819).

Lucas, Pap. Exot. p. 9. t. 5. f. 1. (1835).

Boisd., Sp. Gén. I. p. 235. n. 57. (1836).

De Haan, Verh. Naturl. Gesch. p. 34. (1839).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 6. (1844).

Diurnal Lepidopt., I. p. 14. n. 115. (1846).

G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 28. n. 135. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 39. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 113. n. 226. (1857).

Zetides Sarpedon. Hübn. Verz. bek. Schmett. p. 85. (1816).

“ Samml. Exot. Schmett. III. t. 471. (1806—1824).

Chlorisses Sarpedon. Swainson, Zool. Ill. 2nd series, t. 89. (1831—1832).

Upper surface brownish-black; a broad transverse bluish-green band, common to both wings, narrowed at the extremities, and separated, towards the apex of the primaries, into rounded spots.

Secondaries obtusely dentate, a sub-marginal row of five irregular bluish-green lunes; expanse 4.13 inches.

Below, paler, with the band and spots as above, and having a nacreous reflection; six red dashes on the posterior wings; one transverse, near the base, separated from the common band by a deep black line; four lunulate, on a darker ground color than the rest of the wing, midway between the common band and the sub-marginal lunules; the sixth, on the anal margin, extends from it to the end of the bluish-green band.

Body black above; cinereous below.

Hab.—China, ♀ (In my collection.)

China, Moluccas, Papua, Java, (Coll. Boisd.)

India, Penang, Sandwich Islands, (Coll. Brit. Mus.)

Northern India, Java, Canara, (Coll. E. I. Co.)

Boisduval remarks "that specimens from Java are always much less than those from the Moluccas."

"At Masuri this is one of the commonest, but not the least beautiful of our butterflies; it appears early in May, and is found till the end of the rains in September. It usually frequents the top of oak trees, where it flits about with a jumping or jerking flight, and is somewhat difficult to capture from its quickness, and the height at which it keeps."*

Var. *a. Pap. Sarpedon*. G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 28. n. 135. Pl. 4. f. 1. (1852).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 39. (1856).

"With the oblique band on all the wings narrower."—Gray.

Hab.—Ceylon, (Coll. Brit. Mus.)

Var. *β. Pap. Sarpedon*. G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 28. n. 135. (1852).

"List. Lep. Brit. Mus. Pt. I. p. 39. (1856).

Westw. Partingt. in Brit. Encyc. Butt. (1837).

"With the oblique band on all the wings extremely broad in the middle."—G. R. Gray.

The figure of this differs also from my specimen in having a black anal spot encircled with a white iris. Lucas' figure is much less than my specimen, and has but four sub-marginal lunules instead of five.

* Capt. T. Hutton, Proc. Ent. Soc. V. p. 51. (1848).

Larva. Cat. Lep. Mus. E. I. Co., I. t. III. f. 8. (1857). Copied from De Haan.

Green; segments somewhat square, tapering from the third to the head; spiracles black; three lateral black dots on the three anterior rings, the last being ocellate.

"In Ceylon it feeds on the Cinnamon and Sour-sop."—*E. L. Layard.*

Pupa. Cat. Lep. Mus. E. I. Co., I. t. III. f. 8a. (1857). Copied from Mr. E. L. Layard's drawing, taken in Ceylon.

Green, with some longitudinal yellowish rays; the most striking peculiarity is the abrupt termination of the head; it is reduced to the level of the protuberance on the thorax.

25. **Pap. Moorei**, nov. sp.

Male.—Upper surface pale yellowish-white; seven transverse black bands on the primaries; all arising from the costal margin, the first extends to the inner margin; the second, as far only as the sub-median nervure; the three following are bounded by the median nervure, and are contained within the disc, the fifth being at its extremity; the sixth and seventh, which last is marginal, are continued to the inner angle, becoming confluent beyond the third sub-median nervure; the space confined between these latter two, and the fifth, is of a deeper yellow than the rest of the surface, and sub-divided into spots by the black nervules.

Base of wing somewhat greenish.

Secondary wings, of the same color, but so very thin that the markings of the lower surface can be plainly seen above; area near the exterior margin and tail, thickly powdered with dark gray atoms; a marginal row of seven black lunate spots, situated above the white indentations, an obscure sub-marginal row of the same at the upper part of the grayish area, of which the two outer are the most distinct; anal indentations yellow; tail very long and narrow; length 1.08 inches; ciliæ white; expanse 3.75 inches.

Body yellowish-white, with a black dorsal and two lateral bands.

Under surface: fore wings same as above, with the exceptions that the second band is produced a little farther than the sub-median nervure, and the sixth and seventh are not confluent.

Posterior wings yellowish; three principal transverse bands, one very narrow, extends along the sub-median nervure; the other two, much broader, arise, one at about a fourth, the other at half the length of

the costa; all these are thrown into a large sub-triangular black spot, situated on the abdominal margin, and divided by two narrow white lines; beyond the third transverse band a row of seven large black rounded spots, arising also from the costa; of which the first three are confluent; the three following are arranged in the form of a triangle, the one which forms the apex being within the cell; and the seventh at the extremity of the third transverse band; the marginal and sub-marginal lunules very distinct, that one on the anal angle throwing off a broad grayish-black prolongation, nearly touching the seventh spot, and the large black patch on the anal margin; enclosing between these three, a large orange spot; some orange atoms on the lower side of this offshoot, and also in the third median interspace; tail has a whitish ray down the middle.

Hab.—Philippines, (In my collection.)

I take pleasure in dedicating this fine species to Mr. Frederick Moore, who has contributed very largely to our knowledge of Eastern Lepidoptera.

26. **Pap. Xuthus**, Linné.

Pap. Xuthus. Linn. Syst. Nat. II. p. 751. n. 34. (1767).

Drury, II. t. 9. f. 2. (1773).

Cram. I. t. 73. f. A. B. (1775).

Herbst, Pap. t. 49. f. 3, 4. (1788).

Fab. Ent. Syst. III. i. p. 32. n. 92. (1793).

Godt. Encyc. IX. p. 58. n. 90. (1819).

Lucas, Pap. Exot. p. 36. t. 19. f. 1. (1835).

Boisd., Sp. Gén. I. p. 327. n. 170. t. 1. f. 1, 2. (1836).

De Haan, Verh. Naturl. Gesch. p. 41. (1839).

Herr. Schæff. Suppl. t. 86. f. 411—413. (1843).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 15. (1844).

Diurnal Lepidoptera, I. p. 16. n. 157. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 36. n. 178. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 49. (1856).

Cat. Lep. Mus. E. I. Co. I. p. 111. n. 223. (1857).

Jasoniades Xuthus. Hübn., Verz. bek. Schmett. p. 83. (1816).

Upper surface, fore wings black; discoidal cellule contains two transverse pale yellow dashes near its extremity; farther up, four interrupted rays, of the same color, converging at the base; two broad lines below the median nervure, one very near the inner margin, and the upper is bent at a very obtuse angle; a mesial band of sagittate spots, the two upper containing a black pupil; above these, and nearer the margin,

an oblong dash of grayish-blue atoms, and a rectangular yellow spot; a sub-marginal row of yellow lunules; indentations marked with narrow yellow lines.

Posterior wings, basal half yellow, divided into spots by the nervules, black and dilated; a large black spot above the sub-costal nervure, just touching the middle of the cell; exterior half black, containing a sub-marginal row of large yellow lunules, of which one limb of the fifth extends part way down the tail, which is long and tapering, but blunt at the extremity; some obscure lunules, formed of bluish-gray atoms, just below the yellow basal half; and a yellow anal spot, containing a black pupil; expanse 4.63 inches.

Body: thorax, above black, with two sub-dorsal yellow bands; abdomen yellowish-brown above, with an incomplete dorsal black band covering the first two segments only; yellow below.

Under surface, primaries, paler than above; general markings the same, though the spots and dashes are much larger; the sub-marginal lunules are confluent, and separated only by pale brown nervules; between these and the central band there is a waved grayish line, extending nearly the length of the wing.

Posterior wings, yellow space larger, veins not so much dilated; upper part of the black portion marked with seven bluish lunules, the fourth and fifth surmounted by two red spots; the sub-marginal lunules are very large, the first three containing some red atoms, the fourth assuming a quadrilateral shape; anal ocellus has the iris orange-red.

Hab.—China, (In my collection.)

“China, Thibet, Persia, Siberia.” Boisd.

China, Northern Australia, (Coll. Brit. Mus.)

Northern India, Chusan, (Coll. E. I. Co.)

“At Chusan the perfect insect appears during August and September.”—*Dr. Cantor's Notes.*

Larva, Cat. Lep. Mus. E. I. Co., I. Pl. IV. f. 1. (1857). Copied from De Haan's figure.

Green, with a velvety black band across each segment; some of these bands are divided laterally, the portions excised on some of the central segments have the form of an irregular *sigma*, with the curves reversed; towards the anal segment the bands are undivided; towards the head, the part cut off is simply a black dot; two long orange-colored

retractile processes in the head; stigmataë black; lower part of abdomen yellowish.

Boisduval says it feeds upon umbelliferous plants.

27. **Pap. Machaon**, Linné.

Pap. Machaon. Roesel, Ins. I. ii. t. 1. (1746).

Linn. Syst. Nat. II. p. 750. n. 33. (1767).

Herbst, Pap. t. 45. f. 1, 2. (1788).

Fabr. Ent. Syst. III. i. p. 30. n. 87. (1793).

Hübner, Eur. Schmett. f. 390, 391. (1805-1824).

Godt. Encyc. IX. p. 57. n. 89. (1819).

Boisd., Sp. Gén. I. p. 328. n. 171. (1836).

Kollar. in Hügel's Kaschmir. Pt. II. p. 406. (1842).

Herrich-Schäffer. Europ. Schmett. t. 116. (1843).

E. Doubled., List. Lep. Br. Mus. Pt. I. p. 15. (1844).

G. R. Gray, Lep. Ins. of Nepaul. p. 6. t. 3. f. 1. (1846).

Diurnal Lepidoptera, I. p. 16. n. 158. (1846).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 37. n. 180. (1852).

Nat. Library, XXIX. Duncan, p. 94. Pl. 4. f. 1. (1855).

G. R. Gray, List. Lep. Brit. Mus. Pt. I. p. 50. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 111. n. 224. (1857).

Pieris Machaon. Schrank.

Jasoniades Machaon. Hübner, Verz. bek. Schmett. p. 83. (1816).

Amaryssus Machaon. Dalm. Königl. Vel. Acad. Holm. XXXVII. p. 85. (1816).

Upper surface, fore wings, base black, powdered with yellow; a broad marginal band of the same color, sinuate internally, and containing eight semi-circular yellow spots, preceded by yellow atoms, parallel with the outer margin, which is narrowly edged with yellow; central portion of wing yellow, having three large black patches on the costal margin, one within the discal areole, one at its extremity, and the third just beyond; nervules broadly bordered with black.

Posterior wings yellow; abdominal margin dusky, clothed with long yellow hairs; a very broad marginal black band, sinuate and sharply dentate interiorly, containing six large yellow lunules, which are preceded by a row of the same, very imperfectly defined, formed of blue atoms, and followed by a marginal series of yellow crescents placed on the indentations; a large round red spot on the anal angle, surmounted by a violet-blue arc anteriorly, and almost encircled by a black line; nervules dusky, and disco-cellular nervules marked with a black streak; tail black, linear; expanse 3.5—4 inches.

Under surface resembles the upper, the most considerable differences

being in the marginal yellow border of both wings, and in the presence of two or three faint red spots behind the discoidal cell of the posterior wings, and another upon their outer angle; the blue lunules of the upper surface are much narrower; nervules are all broadly black; and the general color is lighter.

A broad black dorsal band upon the body, the rest of which is mostly yellow, with the exception of four short narrow ventral black lines near the anus.

Hab.—Europe. Himalayas. (In my collection.)

Europe. N. India. (Coll. Brit. Mus.)

Europe, Siberia, Syria, Egypt, Coast of Barbary, Nepaul, Cashmere. (Coll. Boisd.)

Himalaya, N. India, Kumaon, Bootan. (Coll. E. I. Co.)

“California.” (Rev. J. G. Morris.)

The above description was taken from an European insect; my Himalayan specimen ♀ differs in the following respects:—it is much less, expanse being but 3 inches. On the upper surface, the black veins are more dilate; the marginal black band of the fore wings narrows towards the apex, whilst in the European specimens it is of equal width throughout, and the yellow marks contained within are oblong dashes, instead of semicircular spots. On the secondaries, the black band, sinuate only within, is separated from the black discal arc by but a very small yellow dot.

Underneath, the chief difference is, that the submarginal yellow border on the hind wings, is not continuous, but divided into lunate spots as above.

The body is totally destitute of any black ventral lines.

Var. *a. Pap. Machaon*. G. R. Gray, Cat. Lep. Brit. Mus. pt. I. p. 37. n. 180. (1852).

Cat. Lep. Mus. E. I. Co. I. p. 111. n. 224. (1857).

Pap. Sphyrus. Hübn. Europ. Schmett. f. 776, 777. (1805—1824).

Boisd. Sp. Gén. I. p. 329. n. 171. (1836).

Boisduval says, “this is simply a smaller insect, in which the black is more predominant.”

Hab.—“Europe.”—*Hübner*.

Var. *β. ♀. Pap. Machaon*. G. R. Gray, Cat. Lep. Br. Mus. pt. I. p. 37. n. 180. (1852).

DeHaan. Verh. Naturl. Gesch. p. 42. t. 5. f. 2. (1839).

Cat. Lep. Mus. E. I. Co. I. p. 111. n. 224. (1857).

Hab.—“Japan.”—*De Haan*.

"*P. Machaon* is seen on the wing at Deyrab, in the valley of the Dhoon, as early as February, and in April its larvæ are abundant there upon the Carrot. At Masuri, in the Hills, it appears in the latter end of March, and continues till October. It is abundant about Simla, and extends far into the interior."*

Larva. Nat. Library Duncan. XXIX. p. 94. t. 3. f. 1. (1855).

Cat. Lep. Mus. E. I. Co. I. t. IV. f. 2. 2a. (1857).

"The larva is green, with a black velvety transverse band across each segment, bearing four spots of bright orange; it possesses the orange-colored retractile process in the head, from which exudes a liquid drop of a strong aromatic scent, when the insect is touched, precisely as in the European larva. The food is the wild and garden Carrot, and the leaves and flowers of the Radish. I have taken the larvæ at Masuri early in May, and the pupa on the 18th May."*

Pupa "is green, with a streak of yellow on each side, and an irregular row of yellow spots on the back."—*Duncan*.

In England the imago appears from May to August.

28. **Pap. dissimilis**, Linné.

♂. *Pap. dissimilis*. Clerck. Icon. t. 16. f. 2. (1759).

Linn. Syst. Nat. II. p. 782. n. 195. (1767).

Cram. I. t. 82. f. C. D. (1775).

Sulz. Gesch. Pl. 18. f. 6. (1776).

Ræmer, Gen. Ins. Pt. 18. f. 6. (1789).

Fab. Ent. Syst. III. I. p. 38. n. 113. (1793).

Herbst. Pap. t. 126. f. 2. 3. (1793).

Godt. Encyc. IX. p. 175. n. 143. (1819).

Lucas. Pap. Exof. p. 46. t. 23. f. 2. (1835).

Boisd. Sp. Gén. I. p. 377. n. 224. (1836).

E. Doubled. List. Lep. Brit. Mus. Pt. I. p. 19. (1844).

Diurnal Lepidoptera, I. p. 21. n. 263. (1847).

G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 71. n. 330. (1852).

" List. Lep. Br. Mus. Pt. I. p. 84. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 91. n. 187. (1857).

Clytia dissimilis. Swainson. Zool. Ill. 2d series, t. 120. (1832—1833).

Male.—Wings. Upper surface black, marked with a number of white rays and spots, separated chiefly into two transverse rows, of which the inner is composed of long rays, and the outer, much less in length, of lunulate spots and dashes; the cell also has white lines radiating from the base, and three rounded white spots near its extremity.

* Capt. T. Hutton, Trans. Ent. Soc. V. p. 47.

Fore wings sinuate, with small white spots upon the positions of the obsolete indentations. Hind wings, dentate, deeply so, in some specimens; indentations, white, sometimes deep yellow, more particularly at the outer and anal angles; a fulvous-yellow lune at the anal angle; all the white parts are more or less sprinkled with fine black atoms; expanse 4—4½ inches.

Under surface very similar to the upper, but the white area is much enlarged, and the small indentations of the posterior wings expand into a marginal row of large yellow lunules, edged on the margin with a narrow white line.

Body blackish, with the head, palpi, breast and thorax spotted with white, abdomen striped with whitish lateral rays.

Hab.—Philippines, Java. (In my collection.)

China, Bengal, Nepaul. (Coll. Boisd.)

Northern India, Canara. (Coll. Mus. E. I. Co.)

N. India, Ceylon, Australia, Hong Kong. (Coll. Brit. Mus.)

The Javanese ♂ is larger, and the sub-marginal lunules, are thrown back much further from the outer margin than in the Philippine specimens. On the under surface, the chief difference is the conversion of the white lunules of the posterior wings into orange yellow, whilst those on the margin are very much larger; the hind wings are also very strongly dentate.

Var. *a. Pap. dissimilis* ♂. G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 72. n. 330. (1852.)
Cat. Lep. Mus. E. I. Co. I. p. 92. n. 187. (1857).

Pap. Echidna. De Haan, Verh. Naturl. Gesch. p. 42. t. 8. f. 6. (1839).

Boisd. Sp. Gén. I. p. 378. n. 224. (1836).

Differs from the normal type in having the longitudinal rays a little shorter, and the lunules on the under surface of the secondaries, together with the anal spots, and the indentations, white.

Hab.—Timor. (Coll. Boisd.)

♀ *Pap. dissimilis*.

Pap. Panope. Linn. Syst. Nat. II. p. 782. n. 195. (1767).

Cram. III. t. 295. f. E. F. (1780).

Fab. Ent. Syst. III. i. p. 59. (1793).

Godt. Encyc. IX. p. 75. n. 142. (1819).

Boisd., Sp. Gén. I. p. 373. n. 218. (1836).

Kollar, in Hügel's Kaschmir. Pt. II. p. 406. (1842).

E. Doubled., List. Lep. Brit. Mus. Pt. I. p. 19. (1844).

Princeps Dominans Panope. Hübn., Samml. Exot. Schmett. I. t. 132. (1806—1824).

Arisbe Panope. Hübn., Verz. bek. Schmett. p. 89. (1816).

Pap. Panopes. Godt., Encyc. IX. p. 75. n. 142. (1819).

Pap. Clytia. Linn. Syst. Nat. II. p. 781. n. 189. (1767).

Fabr. Ent. Syst. III. i. p. 127. n. 387. (1793).

Female.—Upper surface brownish-black, lighter towards the outer margin. Anterior wings present a sub-marginal row of lunulate white spots; that one at the apex, however, is a large oblong dash; the place of the indentations marked with small white spots.

Posterior wings have two rows of white marks; the inner sagittate and indistinct, the outer white and lunate, excepting the anal spot, which is bright orange-yellow; indentations same as in the male; expanse 4.25 inches.

Below, rich chocolate-brown; white spots on the fore and hind wings are more brilliant; and in addition to the two rows of white marks on the hind wings, there is a marginal row of yellow spots, as in the male, above the indentations.

Body as in the male.

Hab.—The same as the male.

Var. *a. Pap. dissimilis* ♀ Moore, Cat. Lep. Mus. E. I. Co., I. p. 92. n. 187. (1857).

“Anterior wings wholly brown.”

Hab.———? (Coll. E. I. Co.)

Var. *β. ♀ Pap. dissimilis*. G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 72. n. 330. (1852).

“List. Lep. Br. Mus. Pt. I. p. 84. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 92. n. 187. (1857).

Pap. Palephates. Westw., Arc. Ent. p. 127. t. 79. f. 1. (1845).

E. Doubled., Cat. Lep. Brit. Mus. Pt. I. p. 19. (1844).

Diurnal Lepidopt., I. p. 21. n. 265. (1847).

“Closely allied to *P. Panope*, Linn., of which it will probably prove only a geographical variety, differing from the typical Continental individuals in the large pale patch near the tip of the fore wings, and in the hind wings beneath, having the veins margined with pale buff. In the disposition of the markings it otherwise accords with *P. Panope*, but its fore wings are more ovate, the apical margin being a little rounded; they are of a rich brown color, with a large whitish patch, formed of three confluent oblong spots near the apex of the wing, followed by a single small oval spot close to the apex; and beneath these are several small conical spots, which become united with the marginal

spots, of which there are only six, the apical portion of the wing not possessing them; besides these there are three oval or round spots preceding them, towards the anal angle. The hind wings are brown, with five cuneated pale patches extending from the anal margin, succeeded by six lunate pale spots extending from the outer angle, and with five fulvous incisural spots, the anal angle bearing a larger oval fulvous spot, in which is a black dot. The fore wings on the under side are of a paler brown color, but similarly marked beyond the middle; the base also with several pale dashes. The hind wings have the veins from the base to beyond the middle edged with pale buff; half way between the discoidal cell and the hind margin of the wing is a row of five white crescents, shaded off into the ground color of the wing, and separated by brown arches from a row of white horse-shoe marks, within which are six large fulvous incisural marks; the base of all the wings with small round white spots; the body and abdomen are also spotted with black."—*Westwood*.

Hab.—Philippines, (In my collection.)

"Manilla, (Mus. Nat. Paris.)" *Westwood*.

"Occurs in warm glens, as well as in the Dhoon, but it does not appear to be very numerous."—*Hutton*.

This species is very common in the Philippines.

Larva. Cat. Lep. Mus. E. I. Co., t. II. f. 3. 3a. (1857).

Cylindrical, fleshy and smooth on the surface; bluish; from the second to the sixth segment, inclusive, each ring is furnished with a double pair of lateral spines, short, black, and curved backwards; beyond this, a simple lateral spine; three yellow bands on the anterior portion, confluent at the head and seventh segment, whence the united dorsal band extends to the end of the ninth segment; two sub-dorsal bands on the three following rings, disconnected from the dorsal, and terminating on the anal segment in two round yellow dots, separated from the band by a narrow black line. Surface spotted with black, and marked with red tubercles; length about three inches.

Chrysalis straight, cylindrico-conical; brown, wing covers and head drab; head truncate and indented.

This description was taken from the figures mentioned above, which were copied from the drawings of General Hardwicke, now deposited in the Library of the British Museum.

"This species has been also reared in Ceylon by E. L. Layard, Esq. Its transformations were observed by Mrs. Hamilton in Moulmein. They were also observed by Lady Gilbert, among whose drawings figures are given. Her ladyship states that 'it feeds on a plant called by the natives *Maike*. The larva was obtained on the 26th of July; two days after it commenced its transformation, and on the following day the chrysalis resembled a dried twig, adhering to the frame only by the extremity of the tail, and supported on each side by two fine threads; in this state it died.' " *

LEPTOCIRCUS, Swainson.

29. **Leptocircus Meges**, Zinken-Sommer. sp.

Pap. Meges. Zinken-Sommer. Nova Acta Acad. Cur. Nat. XV. p. 161. (1831).

Leptocircus Meges. E. Doubled., Zoologist. III. p. 23. fig. (1843).

" List. Lep. Brit. Mus. Pt. I. p. 20. (1844).

Diurnal Lepidopt., I. p. 23. n. 2. (1847).

G. R. Gray, Cat. Lep. Br. Mus. Pt. I. p. 73. n. 337. (1852)

" List. Lep. Brit. Mus. Pt. I. p. 86. (1856).

Cat. Lep. Mus. E. I. Co., I. p. 85. n. 173. (1857).

Erycina Curius. Godt. Encyc. IX. p. 827. n. (1819).

Iphiclides Curius. Hübner Zuträge. f. 645-6. (1818).

Leptocircus Curius. Swains. Zool. Ill. 2nd series, t. 106. (1832-33).

Boisd., Sp. Gén. I. p. 381. t. 3. B. f. 1, t. 1. C. f. 3. (1836).

Upper surface, wings black, traversed between the base and middle by a common green band, and suddenly contracting on the disc of the secondaries, where it terminates in a white streak; apical half of primaries hyaline, edged by a narrow black border and crossed by black veins; tail very long, recurved at the extremity, and bordered externally with white; expanse 1.75 inches.

Below, the band changes to a greenish-white on the fore wings; nacreous on the hind wings, which are marked on the abdominal margin by three curved whitestreaks, chevron-shaped. Base of wings also whitish.

Body black; a green sub-dorsal line on the thorax; white below, with a lateral and sub-lateral row of black dots.

Antennæ black, under part of club, reddish.

Hab.—Philippines, (In my collection.)

Northern India, (Coll. Brit. Mus.)

Java, Siam, (Coll. Boisd.)

Java, (Coll. E. I. Co.)

* Cat. Lep. Mus. E. I. Co. I. p. 92. (1857).

My single specimen (♂) is in such poor condition that I am still doubtful whether it should be placed under this title, or that of *Curius*. I located it temporarily under this species, though the other would have answered equally as well, for the purpose of contrasting it with the following new and very distinct species. It may perhaps be *L. Corion*, Gray, of which, however, I have seen neither figure nor description.

30. **Leptocircus Wilsonii**, nov. sp.

Upper surface black; abdominal margin of posterior wings chocolate-brown, fringed with long hairs; apical half of fore wings hyaline, and bordered as in *Meges*; common pale green band on the wings, terminating on the disc of the secondaries in a white streak as in *Meges*; but that part on the primaries is, in the *male*, simply a narrow pale green line; in the *female*, it is half the width of the band on the posterior wings; the lower half of which, together with the tail, is irrorated with brilliant white atoms; this last, which is not recurved at its extremity, and the indentations above it, are bordered with white, as in *Meges*. Expanse 1.50 inches, ♂; 1.62 inches, ♀.

Under surface, the common band is shining, pearly white on both wings; base greenish-white. In the *male*, a white lunule on the anal margin, followed by a small dot, and an oblong dash of the same color; in the *female*, the white lune is followed by two small dots, the last situated anteriorly.

Body black, with two lateral white lines on each side of the abdomen; palpi whitish; antennæ black, club white at the tip; claws bifid.

Hab.—Philippines, (In my collection.)

I have dedicated this pretty little species to Dr. Thos. B. Wilson, of Philadelphia.

This genus is certainly well represented, and considering its comparative rarity, appears to be quite common in the Philippines. It is with regret that I cannot give a diagnosis of the larva, as it would enable us to determine with certainty its position, at present very anomalous, in the family *Papilionidæ*.

EURYCUS, Boisd.

31. **Eurycus Cressida**. Fabr. Sp.

♂. *Papilio Cressida*. Fab. Ent. Syst. III. i. p. 20. n. 62. (1793)
Donovan, Ins. New. Holl. p. 12. f. 2. (1805).
Godt. Encyc. IX. p. 76. n. 145. (1819).

Nestorides Cressida. Hübn., Zutr. t. 841, 842. (1818).

Cressida Heliconides. Swains. Zool. Ill. 2nd ser. t. 94. (1832).

♀. *Papilio Harmonia*. Fabr. Ent. Syst. III. i. p. 20. n. 63. (1793).

Donov., Ins. of N. Holl. Pl. 12. f. 1. (1805).

Papilio Harmonides. Godt. Encyc. IX. p. 76. n. 146. (1819).

Eurycus Harmonia. Boisd. Sp. Gén. I. p. 393. n. 2. (1836).

♂ ♀ *Eurycus Cressida*. Boisd. Sp. Gén. I. p. 393. n. 1, 2. (1836).

E. Doubled., Cat. Lep. Brit. Mus. Pt. I. p. (1844).

Diurnal Lepidopt., I. p. 24. n. 1. (1847).

G. R. Gray, Cat. Lep. Brit. Mus. Pt. I. p. 73. n. 338. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 86. (1856).

Male.—Upper surface: fore wings, oblong, diaphanous; the base, and two rounded areolar transverse spots, black, the costal and exterior borders, blackish. Inferior wings slightly dentate, black; a white central band, deeply dentate, especially on the exterior border, divided into a number of spots by the black veins; disco-cellular nervules, marked by a black lunule; a sub-marginal row of five vermilion-red round spots, all nearly or quite obsolete, with the exception of that one, nearest the angle, which is always very distinct; indentations narrowly edged with white; expanse 3.86 inches.

Under surface, fore wings as above; hind wings not so black as above; the red spots are all very distinct, and on the margin five large whitish spots, placed upon the indentations.

Body black, with the anus, two spots on each side of the thorax, and the sides of the pro-thorax red; palpi, white.

Female.—“A little less than the male. Superior wings oblong, semi-transparent, yellowish-white; costa and apex, brownish, and a small deep black spot at the extremity of the discoidal cellule. Inferior wings slightly dentate, or the same color as the primaries, with a broad brownish border, containing a row of five yellowish white spots, very small, and rounded; indentations of a yellowish-white.

“Under surface similar to the upper.

“Body, black; anus red, and prothorax spotted with white.”—*Boisd.*

Hab.—Australia. ♂. (In my Collection.)

Australia. ♂. (Coll. Boisd.)

Australia. ♂ ♀. (Coll. Brit. Mus.)

“Van Dieman's Land.” Swainson.

SERICINUS.

32. *Sericinus Montela*, Gray.

♂ *Sericinus Montela*. G. R. Gray, Proc. Zool. Soc. p. 71. (1852).

“ Cat. Lep. Brit. Mus. Pt. I. p. 78 n. 361. t. XIII.
f. 1, 2. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 93. (1856).

Sericinus Telemon. Diurnal Lepidopt. p. 530. Suppl. Pl. f. 1. (1852).

Male.—Upper surface, yellowish-white. Primary wings have a large sub-triangular black spot at the base, which is divided into three spots by the nervures; a large black sub-costal patch in the middle of the cell; two interrupted transverse lines, on the disc; a marginal black band, obsolete, towards the inner angle; costa faintly lined with black, and some black atoms near the apex.

Hind wings have a broad areolar transverse black band; a broad band obliquely across the costal area; and a large black anal patch, extending inwardly as far as the discal nervure, and being connected with the costal band, by a narrow black line; this anal patch contains anteriorly, a crimson band, posterior to which there are two lunes, composed of blue atoms; head and thorax black, with a red collar; abdomen yellow, having a black dorsal band, a lateral row of large black dots, and some ventral longitudinal rays; tail long, linear, yellow at base and extremity, and black in the middle; expanse of wing 3.13 inches; length from head to tip of tail 2.5 inches.

Below the only perceptible difference, though, as usual the markings are much paler, is in the presence of a red spot, in the black costal patch of the posterior wings.

Hab.—China. (In my collection.)

Northern China. (Coll. Brit. Mus.)

“This species was brought by Mr. Fortune, who says that they are found in the valleys among the hills.”—*G. R. Gray*.

Gray's figures differ somewhat from the specimens. Expanse ♂, 2.75 inches—3.10 inches. Markings vary in size and number, the largest being the darkest, and also having the crimson band much brighter. In my ♂, there is an indistinct black lune, near the inner angle of the anterior wings, observable in neither of his figures; also, the blue marks on the posterior wings are distinctly lunate, instead of being dots, as he represents.

♀ *Sericinus Fortunei*, G. R. Gray, Proc. Zool. Soc. p. 72. (1852).

“ Cat. Lep. Brit. Mus. Pt. I. p. 79. n. 363. t. XIII. f. 5. (1852).

“ List. Lep. Brit. Mus. Pt. I. p. 93. (1856).

Sericinus fasciatus. Brem. & Grey. Beitr. Schm. des Noerd. China. p. 5. (1853).

Female.—“The primary wings yellowish-white, with many irregular black spots which vary in size, some of them are so placed that they apparently form five bands across the wing, and the exterior margin is also black. The secondary wings are also yellowish white, with a basal band and three irregular curved bands of black spots; the second band from the base is broadest at the anterior angle, and marked with a small crimson spot; while that portion towards the anal angle is margined exteriorly by an irregular crimson band, which extends from the angle to the second sub-costal nervule; the third or marginal band is ornamented on the deep black below the crimson by a series of pale blue lunes. The caudal appendages are slender, of about one inch in length, the base and apex yellowish-white, with the intermediate part black.

“The under surface of all the wings is less prominently marked; otherwise they are similar to the upper side; except that on the primary wings there are two crimson spots, one on the band near the costal area, and the other on the posterior margin.

“The specimens brought by Mr. Fortune were found on the sides of the hills.”—*G. R. Gray*.

Expanse 2.87 inches.

Hab.—China. (In my collection.)

Northern China. (Coll. Brit. Mus.)

There is certainly great incongruity between Mr. Gray's description and his figure representative of the same sex. Neither are wholly correct, in comparison with the specimen in my possession. In the figure, there is but one blue lune on the posterior wings, instead of “a series,” whilst in mine there are three. The caudal appendages, in the figure, are not very slender, and by no means an inch in length, as stated in the description, but only about .63 inch, neither is it at all yellow at the tip. In my specimen they are .93 inch in length, otherwise agreeing with his description.

Below, there is not the slightest vestige of red spots upon the ante-

rior wings, and there are two red spots on the costal margin, instead of being "similar to the upper side."

I have described a species below, which, if it does not prove to be distinct from this, is at least a remarkable variation from either Mr. Gray's figure or description. I have named it after my friend, Mr. E. T. Cresson, of Philadelphia:—

33. *Sericinus Cressonii*, nov. sp.

Female.—Differs from *Sericinus Fortunei* (Montela. ♀) in the following particulars:—

Fore wings, have the fifth transverse black band connected with the margin by dilated black nervules, forming a sub-marginal row of small yellow lunes.

Hind wings, have the crimson band wider, and the two last sections are lunate, and separated from each other, and the remainder of the band by intervening black lines, below this, four pale blue lunes: a very large yellow patch on the costal margin near the outer angle; a large lune of the same color, situated on the angle: tail, yellow at base and tip, intermediate portion black, very long, 1.25 inches and narrower than in any other species of the genus; expanse 3.13 inches.

Below; the primaries have four red spots, two just beyond the extremity of the discoidal cell, and the others on the inner margin. Secondaries, have two red spots on the costal border, and the space posterior to the crimson band is irrorated with blue atoms, not formed into distinct figures but covering the whole surface.

Thorax and head, black, a yellow line on each side of the thorax, below yellow, with red spots. Abdomen yellow, a broad dorsal band, two rows of lateral dots, and two ventral rays, all black.

Hab.—China. (In my collection.)

Eggs, extracted from the body, resemble a flattened spheroid, greatest diameter, .042 inch, least, .025 inch, white, with a double black ring around the middle, parallel with the direction of compression.

I have now finished the family *Papilionidæ* as far as possible in relation to my own collection, but before closing this paper, I desire to present a few remarks of Thos. Horsfield, Esq., treating of what may

be emphatically called the natural system of classification, in which the natural history of the whole insect is considered, from the ovum to the imago, in contradistinction to the artificial, which considers only the characters of the perfect insect.

I have here followed the latter, not because I think it is most correct, but simply because, like all artificial systems, it is much the most convenient for reference, and for the more important reason that I was totally unacquainted with the metamorphoses of these exotic butterflies, which play such a prominent part in the formation of the natural system, but was entirely dependent upon the statements and figures of others, which, however correct, can never be so fully relied upon as personal observation.

Without proceeding too extensively into the elaboration of Dr. Horsfield's views, who distributes the butterflies with especial reference to the characters of the insect in all its stages, we find that the following points form the basis of his system :

“First. That the series of affinities in groups of the Animal Kingdom is progressive, and that it returns into itself; and thus the groups form circles.”

“Secondly. That the primary groups of those departments of the Animal Kingdom, which have hitherto been investigated, have been ascertained to be limited to five.”

“Thirdly. That each group in a circle is analogically represented by the corresponding group in the other circles.”

These are the essential considerations; he also enumerates several others, but which are subordinate to these.

According to the second law, “the whole Animal Kingdom has been divided into quinary groups, which are again subdivided into groups of consecutively descending value; thus the Animal Kingdom is divided in descending order into Sub-Kingdom, Class, Order, Tribe and Stirps.”

With reference to Tribe I. *Papiliones*, of the Order Lepidoptera—the one with which we are immediately connected—upon the axiom, “that in groups of consecutive minor value, the same principles are found to prevail,” he has divided it into five stirpes, each supposed to be connected with the two adjoining, and the terminal to be, in like manner, allied to the first, so as to form a circle. These have been

named according to the form of the larva, from their resemblance to the five typical groups of the *Ametabola*.

First Stirps, Vermiform.

Second " Juliform or Chilognathiform.

Third " Scolopendriiform or Chilopodiform.

Fourth " Thysanuriform.

Fifth " Anopluriform.

To prevent any misapprehension of the application of these terms, Mr. Macleay says (H. E. p. 423.): "The distinction, however, between affinity and analogy, is perhaps nowhere in Entomology more necessary to be attended to than here; since, in terming larvæ, *Chilognathiformes* or *Chilopodiformes*, it is not meant that they are *Scolopendræ*, or *Juli*, or even near to them in affinity, but only that they are so constructed that certain analogical circumstances attending them strongly remind us of these *Ametabola*."

In the second stirps, the typical division of which (the family *Papilionidæ* of Leach,) we have just completed, the following characteristics are especially prominent:

"*Larva* of a cylindrical form, generally swelled or thickened at the fourth or fifth section of the body, attenuated towards the head and posterior extremity; in the typical genera naked, or covered with short, obtuse, fleshy protuberances; in the extreme genera at the boundary of the neighboring groups, covered with a close silky down, or with short scattered hairs, most remarkably distinguished by a furcula or forked tentaculum, situated between the head and neck, which may be drawn back or thrust forward at pleasure."

"*Pupa*, angulated and mostly tuberculated; in the typical genera, and in those at the confines of the first group, attached by the posterior extremity, braced and vertically suspended with the head upwards; in the genera approaching the third stirps, perpendicularly suspended, according to the habits of that stirps. Representing the *Chilognathiform* or *Juliform Ametabola*."

The genus *Papilio* (including *Ornithoptera* and *Atrophaneura*,) is at present very unwieldy; species are associated, which, except in their nervular arrangement, have but little generic relation with each other, yet sufficient to unite them under this system, provided that they were also agreed in their preparatory stages; but, according to the third law, cited above, we should naturally expect analogical divisions in the genus,

corresponding with those of the tribe, and such, indeed, appears to be the fact, so far as incomplete and sectional investigation will verify it. The Eastern Lepidoptera, as examined by Dr. Horsfield, furnish three sub-typical divisions, all well marked by differences in the antennæ and metamorphoses, and probably in the neurulation, but this will require further investigation.

Thus, then, a division or genus of the stirps having Chilognathiform larvæ, contains within itself species, which, though the larva be Juli-form, present a certain analogical affinity to the larva of the other four stirpes, while in each of these separate groups the imago manifests a character which reciprocally confirms the distinct character of these divisions.

We have already discovered the resembling forms of the third and fourth stirpes; perhaps, in collections of greater extent and from more extensive regions, the Vermiform and Anopluriform representatives may be found, and it would not be strange if one or both would be represented by American types. It would be interesting to determine whether this sub-representation of all the stirpes took place in each stirps, and also in its several genera, and, imperfectly, of course, in the species composing these genera. This subject I will discuss more fully in a future paper.

These analogical divisions form then, very natural sub-genera, into which the present genus *PAPILIO* (*Papilio*, *Ornithoptera*, *Atrophaneura*) may be appropriately divided.

The sub-generic characters are:—

“*First.* Antennæ, filiform at the base, marked along their entire length, with prominent annular rings, and terminated by a cylindrical club, which is attenuated at both ends.”

“The larva of this division is characterized by a smooth surface, and by a swelling or intumescence of the fourth or fifth segment of the body, from which it tapers more abruptly to the head, and in a gradual manner to the anal extremity.”

This division is exemplified by

Pap. Memnon.	Pap. Polytes.	Pap. Machaon.
“ Emalthion.	“ Pammon.	“ Turnus.
“ Alcinous.	“ Demolion.	“ Troilus.
“ Polymnester.	“ Erithonius.	“ Asterias.
“ Helenus.	“ Demoleus.	“ Thoas.
“ Iswara.	“ Arjuna.	“ Cresphontes.
“ Varasi.	“ Xuthus.	

and also by their metamorphoses, as far as known.

To this division, as it is typical not only of the genus, but also of the whole stirps, and exhibits the most perfect production of the order, *Lepidoptera*, I would reserve the Linnæan name *Papilio*.

“*Secondly.* The antennæ agree in form and outline with those of the first, but the annuli, or rings, along their entire length, are comparatively obscure.”

“The larva is cylindrical, very slightly attenuated at the ends, somewhat thick and fleshy, smooth on the surface and provided with short obtuse tubercles along its entire length.”

This is the Chilopodiform modification of the genus *Papilio*, and to which I have assigned the name of *Pachliopta*.

It is represented by the following species:—

Ornithop. Darsius.

“ Pompeus.

“ Rhadamanthus.

“ Priamus.

Pap. dissimilis.

Pap. Hector.

“ Diphilus.

“ Philenor?

“ Polydamus?

“*Thirdly.* The antennæ are slender, filiform at the base, but terminated by an oval, comparatively enlarged, compressed club, on which the annuli are closely arranged and crowded.”

“The larva is smooth, slightly attenuated towards the extremities, somewhat broader or arched in the middle, and marked with regular transverse bands; but its chief character consists in two projecting points from the abdomen.”

It is exemplified by the following species:—

Pap. Sarpedon.

“ Agamemnon.

“ Eurypylus.

“ Antiphates.

Pap. Marcellus.

“ Ajax.

“ Podalirius?

“ Sinon.

These form the Thysanuriform division of the genus *Papilio*, and which I have called *Pathysa*.

The names which I have here proposed are not arbitrary, but have been derived from the union of the first syllable of the generic name, with those commencing the analogical name of the larval form: to complete the series in all its forms, we should then call the first subgenus, as yet unknown, *Pavermia*, and the fifth, *Panoplusia*.



Reakirt, T. 1865. "Notes upon exotic Lepidoptera, chiefly from the Philippine Islands, with descriptions of some new species." *Proceedings of the Entomological Society of Philadelphia* 3, 443–504.

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