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BUTTERFLIES

FROM

CHINA, JAPAN, AND COREA.

BY

JOHN HENRY LEECH, B.A., F.L.S., F.Z.S., F.E.S., ETC.

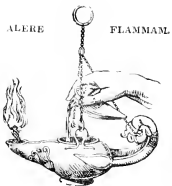
PART II.

LYCENIDÆ, PAPILIONIDÆ, AND HESPERIIDÆ.

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PART II.

Fam. LYCÆNIDÆ.

Genus TARAKA.

Taraka (Doherty, MS.), de Nicéville, Butt. Ind. iii. p. 57 (1890).

“ *Wings* remarkably fragile and thin.

“ *Fore wing*: costa regularly rounded, apex rather acute, outer margin convex, inner margin concave; costal nervure not touching the first subcostal nervule, a little swollen at the base; first subcostal nervule originates two fifths before the end of the discoidal cell; second subcostal arising twice the distance from the base of the first as from the base of the upper discoidal; third subcostal arises midway between the apex of the cell and of the wing; discocellular nervules slightly produced outwardly, lower discocellular longer than the middle one and very slender, meeting the median nervule just beyond its last forking.

“ *Hind wing* long and narrow; costa long, outer margin rounded, composed of two curves meeting at the end of the second subcostal nervule, inner margin convex for most of its length; costal nervure long, extending to the apex, running close to the margin; discoidal

cell abruptly truncate; discocellular nervules meeting the subcostal nervure just beyond its bifurcation, and the median nervure opposite its last bifurcation.

“*Eyes* naked.

“*Antennæ* with thirty joints or more, slender, the last ten (approximately) gradually forming a moderate club, abruptly truncate at the tip, the last joint elongate.

“*Palpi*: last joint covered with long appressed scales, rather short, less than half as long as the preceding joint, fusiiform, pointed, not clavate.

“*Legs* covered with very long white hairs, the middle and hind femora longer than the tibiae, which are greatly swollen in the middle, the tarsi as long as the tibiae, the first joint nearly twice as long as the others united, the last joint with simple claws and paronychæ. Fore tarsi of the male slender, equal in length to the tibiae, without spines or articulations, the claws united for most of their length, diverging at the end. Fore tarsi of the female longer than the tibiae, without spines, the claws as in the male, no distinct articulations; the separation of the last joint is slightly indicated but is quite immovable.” (*Diarty. MS., de Nicéville, l. c.*)

Taraka hamada.

Miletus hamada, Druce, Cist. Ent. i. p. 361 (1875); Pryer, Rhop. Nihon, p. 10, pl. ii. fig. 12 (1886).

Taraka hamada, de Nicéville, Butt. Ind. iii. p. 58, pl. xxvi. fig. 164, ♀ (1890).

Miletus hamada, Druce. “Upperside male, dark brown, lightest in the middle of the anterior wing. Underside of both wings white, crossed from the costal margin of the anterior to the inner margin of the posterior wing by five rows of large black spots, a fine black line round the outer margin of both wings, the fringe alternately black and white. The female differs slightly from the male, being paler in colour above, and having all the black spots smaller below. Exp. ♂ ♀ $1\frac{1}{4}$ inch.

“*Hab.* Yokohama, Japan.” (*Druce, l. c.*)

Pryer gives Yokohama and Nikko as Japanese localities for this species, and says that it is confined to isolated spots: “Some specimens are quite black, and others from the mountains have a patch of greyish white on the fore wing. It varies from $\frac{3}{4}$ to $1\frac{1}{4}$ inch.”

I found this species all along the west coast of Japan. It occurs in the neighbourhood of ponds, and flies among thick bamboo-grass; the black and white under surface of this species renders it very conspicuous when at rest on the leaves.

In China *T. hamada* occurs at Omei-shan, July and August; Moupin, July; Chang-yang and Ichang. None of the specimens exceed an inch in expanse, but in all other respects they are identical with the examples from Japan.

According to de Nicéville, *T. hamada* is a common species in Sikkim at low elevations from April to December, “and shows much variation in the extent of

the white coloration of the upperside, one extreme being entirely black, while the other has the costa and outer margin of the fore wing alone black, the black spots of the underside showing through by transparency on both wings." The species is also recorded from Cachar, Chittagong Hill Tracts, and Shillong.

• *Distribution.* Japan, China, Eastern Java, Himalayas.

Genus LYCENA.

Lycena, sect. 3 (part.), Fabricius, Illiger's Magazin, vi. p. 285 (1807); (part.) Westwood, Gen. Diurn. Lep. ii. p. 488 (1852); de Nicéville, Butt. Ind. iii. p. 66 (1890).

"Body small, slender, and compressed. Wings generally large, and of a delicate texture; in the majority of the species blue on the upperside (at least in the males) and grey or greyish white beneath, and more or less ocellated [as restricted by de Nicéville all the species are ocellated]; the majority having a small black transverse spot at the extremity of the discoidal cell of the fore wing.

"HEAD small, hairy, the hairs often forming a small tuft on the forehead.

"Eyes moderate sized, naked.

"Palpi moderately elongated, compressed, scaly; the middle joint also furnished beneath with detached bristly hairs; terminal joint shorter than half the length of the second joint, and scarcely varying in length in the opposite sexes, slender, nearly naked, acute at the tip.

"Antennæ of moderate length, very slender, with long joints ringed with white, the club distinct, suddenly formed, oblong-ovate, depressed, and sometimes spoon-shaped in dried specimens, the joints of the club very short.

"Fore wing generally elongate, subtriangularly ovate, with the costal margin moderately arched, outer margin always more or less convex, inner margin rather short; costal nerve short, subcostal nervure wide apart from the costa, with two branches preceding the extremity of the discoidal cell, and with a third short branch about halfway between the cell and the tip of the wing; discoidal cell closed by extremely slender middle and lower discocellular nervules, which are transverse, the latter uniting with the third median nervule at a moderate distance beyond its origin; upper discocellular nervule very oblique, or almost longitudinal, forming, in fact, the base of the upper discoidal nervule.

"Hind wing [elongate-ovate, entire; costal margin straight, apex rounded, outer margin very convex, anal angle rounded, abdominal margin nearly straight; costal nerve extending to apex of wing, first subcostal nervule given off some distance before apex of discoidal cell, discocellular nervules very concave, of about equal length, the upper discocellular outwardly, and the inner discocellular inwardly, oblique; discoidal nervule from their point of junction, discoidal cell very short, much less than half the length of the wing, second median nervule originating just before the end of the cell." (*de Nicéville.*)]

"Fore legs of the male slender, tibia in most species terminated by a short curved horny point, in others simple; tarsus slender, exarticulate, elongate, slightly curved and attenuated at the tip, which is terminated by a horny curved point, and armed beneath with short spines.

Of the female similar in size and shape to those of the male, except that the tarsus is articulated and unguiculated like those of the four hind legs.

“*Hind legs* short, slender.

“*LARVA* onisciform, gibbo-scutate or oblong-scutate, with the head and feet small and scarcely perceptible: the body laciniate, and the back convex and generally beautifully coloured.

Pupa oblong, very convex, smooth, obtuse at each end, and marked with obscure spots: in a few species armed with short acute tubercles.” (*Westwood, l. c.*)

As many species originally placed in the genus *Lycæna* have been removed therefrom and placed in other genera, Mr. de Nicéville has modified and amended Westwood's diagnosis, as given above, so as to bring it more in accord with the restricted sense in which the genus is now understood.

Lycæna ægon.

Papilio ægon, Schiffermüller, Wien. Verz. p. 185 (1776).

Papilio argyrotorus, Bergsträsser, Nomen, ii. p. 77 (1779).

Lycæna ægon, Lang, Butt. Eur. p. 103, pl. xxiii. fig. 1 (1881); Pryer, Rhop. Nihon. p. 18, pl. v. fig. 2 (1886).

Lycæna micrargus, Butler, Cistula Entom. ii. p. 283 (1873).

Lycæna pseudægon, Butler, Proc. Zool. Soc. Loud. 1881, p. 851.

“Expands 0·90 to 1·10 inch. The male has all the wings deep blue, rather inclining to violet, with a narrow brownish-black hind marginal border. The hind wings have some faint brown spots along the hind margin. The fringes of all the wings are broadly white. The female is brown, with faint traces of an orange band along the hind margin of the fore wings; the hind wings have a more distinct orange hind marginal band, most conspicuous towards the anal angle, and enclosing four or five black spots. Underside grey: in the female with a tinge of brown; the hind margins of all the wings with a double row of black spots, enclosing an orange band; internal to these an irregular central row of black spots, surrounded by white rings. The fore wings have a round discoidal spot similarly surrounded by white, and no basal spots; the hind wings have four spots between the central row and the base, two of them nearly touching the costa. The bases of all the wings are strongly tinged with blue in the male, more faintly so in the female. The outermost spots of lower hind marginal row are minutely studded with metallic silvery blue. The anterior tibiae are furnished with short spines.” (*Lang, l. c.*)

Larva. “Bright yellow-green, with the dorsal stripe blackish brown edged with whitish from the beginning of the third to the end of the tenth segment: it is widest on the third and fourth, being on them of a rather rounded lozenge form, with a whitish dot near the edge on each side; a dull dark brown small plate in front of the second segment, and a broad semilunar-shaped blotch of the same colour a little behind, divided in the middle by a fine line of the green ground-colour. The dorsal stripe on the eleventh segment becomes broad and squarish, but resumes its linear shape on the twelfth and thirteenth. The subdorsal line is visible from the beginning of the third to the end of the eleventh segment as a greenish-yellow line running between two green ones darker than the ground-colour. At the bottom of the side

along the lateral ridge is a whitish line commencing on the third segment and continued round the anal extremity. Between the dorsal and subdorsal lines on segments three to ten are faintly paler oblique lines of yellow-green, viz. one on each segment sloping downwards and backwards; the warts on the twelfth segment are very often suddenly projected considerably, and then a circle of fine short hairs is visible on their extremities. The surface of the body is also clothed with similar hairs. The head is black, having the base of the papillæ and a streak across above the mouth of buff-colour.

“The *pupa* is about five lines long, smooth, but without polish, the top of the head slightly projecting, the thorax rounded, the abdomen plump, curving on the back outwards and backwards towards the tip, which is hidden in the larva skin, the wing-cases prominent and long in proportion. It is of a dull green tint, with a dark brown dorsal line of arrow-head marks.” (*Buckler, Larva of Brit. Butt. & Moths*, i, pp. 115, 116.)

Feeds on *Ornithogalus purpurascillus* and probably also *Genista anglica*.

Var. **micrargus**, Butler. “Above very like *L. argia* [*? argus*] and *L. ayon*; lilac, with dentated blackish outer border and snow-white fringes; below with the ground-colour of *L. pylaon* (*triton*?, Fabr.); the markings exactly as in *L. argus*, excepting that the submarginal black spots of the secondaries have no trace of metallic colouring about them, and the orange belt connecting the two series of black spots is paler. Expanse of wings 1 inch 1 line. Tokio, Japan.” (*Butler, Cistula*.)

Var. **psendægon**, Butler. “Nearest to *L. ayon* of Europe, the same colours. The male smaller, and with a very narrow black outer border to the wings; fringe narrower, submarginal black spots of secondaries rather smaller; female very faintly shot with steel-blue at the base of primaries, submarginal orange lunules obsolete; secondaries darker, purplish towards the base, bluish at the base; the whole of the black submarginal spots bounded internally by orange lunules, and externally by white ones. Under surface greyer than in *L. ayon*, both sexes washed with pale greenish blue at the base; black spots smaller, but arranged exactly in the same way; submarginal orange spots of the primaries of the male extremely pale; those of the secondaries destitute of metallic spots in both sexes. Expanse of the wings, ♂ 1 inch 2 lines, ♀ 1 inch 3 lines. Iburi, Hokkaido [Yesso], July. Coll. M. Fenton.” (*Butler, P. Z. S.*)

Common at Gensan, Corea, in June and July. It occurs also in Yesso and in the mountain districts of Central Japan. Corean specimens are usually much above the average size.

I have given the original description of *micrargus* and *psendægon*, Butler, as the names may perhaps be retained for the respective Japanese forms to which they refer.

Distribution. Europe, Asia Minor, Armenia, Persia, Eastern Siberia, Corea, Japan.

Lycæna argus. (Plate XXXI, figs. 5, 8, var.)

Papilio argus, Linnæus, Syst. Nat. x. p. 483 (1758); Faun. Succ. p. 283 (1761).

♀. *Papilio idas*, Linnaeus, Faun. Suec. p. 284 (1761).

Lycæna argus, Lang, Butt. Eur. p. 105 (1884); Pryer, Rhop. Nihon. p. 18, pl. v. figs. 1 a, 1 b, 1 c (1886).

“Expands 1 to 1·10 inch. The male is dark blue, nearly the same colour as *L. agon*, which it altogether greatly resembles; the hind marginal border, however, is narrower and more defined, the hind marginal spots of the hind wings are more distinct, and the white marginal fringes are very narrow—not broad, as in *agon*. The female on the upper surface almost entirely resembles the female of *L. agon*, but the orange hind marginal spots are rather more distinct. Underside: ground-colour uniform brownish grey in both sexes; the central row of spots on the fore wings is more even, the last spot but one from the inner margin being more in a line with the rest, and not, as it were, thrust inwards, as in *L. agon*; the silvery spots on the hind margin are much more distinct than in *agon*. The anterior tibiae are not provided with spines.” (*Lang, l. c.*)

Dr. Lang, quoting Guenée, says that the larva is dark green, with a red dorsal line and an oblique reddish streak bordered with whitish on each segment. Food-plants *Genista*, *Melilotus*, &c.

The usual form of this species met with in Japan and Corea is brilliantly tinged with purple. It occurs in the mountainous districts of Central Japan, and I have received specimens from the Island of Kiushiu. The form described below as var. *insularis* has so far only been found in Yesso, and appears to be the only representative of *L. argus* in that island.

Var. *insularis*, var. nov. (Plate XXXI. figs. 5 ♀, 8 ♂.) *Mal.* Ground-colour pale silvery blue; the neuration is whitish except on the marginal area, where it becomes blackish; outer border of primaries broadly black. Secondaries have a well-defined series of submarginal spots followed by a narrow black marginal line. Fringes snow-white.

Female. Black, much suffused with blue-grey about the disc of the primaries; discoidal spot distant and bordered with white; there is a marginal line of almost confluent large black spots preceded by a brownish band. Secondaries have a series of elongate black spots, intersected by a series of brownish lunules and bordered externally with pure white. Fringes greyish tinged with brown.

Under surface of both sexes as in the type, but paler; the female being as pale as typical males and more suffused with blue at the base. The silver spots are in some cases absent.

This form of *L. argus* is easily distinguished from *L. iburicensis* by the character of black marginal borders to all the wings, the different colour of the neuration, and on the under surface by the paler coloration, fulvous markings on the outer margin of primaries, and larger size of these markings on secondaries.

Expanse 34–36 millim.

A long series of this interesting form was taken by my native collectors in the neighbourhood of Hakodate in the Island of Yesso in June and July.

Lycæna argus and *L. agon* are both exceedingly variable insects, and it is

often very difficult to say to which of these species certain specimens should be referred. With regard to var. *insularis* described above, Dr. Staudinger agrees with me that it is a form of *L. argus*, and informs me that he has never previously seen such pale specimens.

Distribution. Europe, Asia Minor, Armenia, Amurland, Japan, Corea, and ? N. China.

Lycæna iburiensis.

Lycæna iburiensis, Butler, Proc. Zool. Soc. Lond. 1881, p. 852; Waterhouse, Aid Identif. Ins. pl. 108 (1882).

"Allied to *L. argus*, but more nearly of the size and colour above of *L. lycornus*. Pale silvery blue with brown veins and broad smoky-brown external borders; fringe very narrow and snow-white; secondaries with broad brown costal area; body above rather darker than the wings. Under surface chalky bluish white; the base, especially in the secondaries, suffused with pale bluish green; black spots arranged as in *L. argus*, but large and intensely black; the orange lunules wanting in the marginal ocelloid spots of the primaries, paler in those of the secondaries; no metallic pupils to the black spots of the secondaries; pectus bluish. Expanse of wings 1 inch 5 lines.

"Iburi, Hokkaido [Yesso], July. Coll. M. Fenton." (*Butler, l. c.*)

Only one specimen of this species appears to be known; this was in Mr. Fenton's collection, and is figured in 'Aid.' As I have not seen the type I am unable to say anything positively about its being a valid species or not, but the figure seems to represent an insect specifically distinct from either *L. argus* or *L. wgon*. In the description of this species the fringes are stated to be snow-white, but in the figure the fringes are chequered with black and white on the upper surface, but are entirely omitted in the drawing of the under surface.

Lycæna ægina. (Plate XXXI. fig. 11, ♂.)

Lycæna ægina, Grun-Grshimailo, Horæ Ross. 1891, p. 451.

"Alis ♂ supra violaceis tenuissimè nigro marginatis ciliis albis; ♀ fuscis, sepe violaceo atomatis, posticis punctis submarginalibus nigris ut in *Lycæna wgon* superpositis maculis rufo-fulvis, ciliis albis, fusco-interruptis.

"Subtus alis ♂ anticis cinerascensibus, posticis albis; fascia omnium lata, rubescenti-aurantiaca, maculis nigris albo tenuissimè circumdati et ut in *Lycæna wgon* dispositis, marginalibus posticarum cæruleo squamatis; ♀ alis fusciscenti-albis.

"♂ ♀ 14-15 mm.

"Hæc species, in systemate hujus generis inter *Lycæna wgon* et *argus* ponenda, in Thian-schan orientali, in montibus Boro-Choro reperta est." (*Gr.-Gr. l. c.*)

I have one male specimen taken by a native collector at a high elevation on the plateau to the north-west of Ta-chien-lu, which seems to belong to this species. It agrees fairly well with specimens from Bogdo Ola in Eastern Thibet sent me by M. Grun-Grshimailo. The ground-colour, however, is more violet; the neuration and margins are blacker, and the marginal spots are more distinct. On the under surface the red submarginal bands are broader and brighter, and on the primaries extend as far as the inner angle.

***Lycæna barine*, sp. nov.** (Plate XXXI. fig. 14, ♂.)

Shining lilac-blue. Primaries have the costa from base to beyond the middle broadly bordered with bluish grey; the outer margin has a rather broad black border. Secondaries have the costa and abdominal margin broadly bordered with black, and there is a series of large black spots on outer margin. Fringes white, intersected with black at the ends of the nervules, and preceded by a series of black spots, each spot placed at the end of a nervule. Under surface pale greyish white, tinged with greenish blue towards the base of secondaries: the primaries have two black basal spots, a curved discoidal spot and a central series of eight spots; there is also a submarginal series of black spots, increasing in width towards inner margin, and two series of small black marginal spots, those comprising the outer series placed on the nervules: secondaries have two basal spots, an elongate discoidal spot, and a central series of seven spots all black ringed with white; there is a submarginal pale orange band bordered inwardly by a series of black Innules; marginal black spots as on primaries.

Expanse 44 millim.

The specimen here described and figured was taken by Pryer at Oiwake, and I believe that it is the identical specimen figured in his 'Rhopalocera Nihonica,' pl. v. fig. 5, as *Lycæna iburiensis*, Butler, of which Pryer says that he had two worn specimens from Nambu, and one good specimen from Assama-Yama (Oiwake). On comparing the figure of this insect with that of *L. iburiensis* in Waterhouse's 'Aid' it will be seen that the two species are very distinct.

***Lycæna optilete*.**

Papilio optilete, Knoch, Beitr. Ins. i. p. 76, pl. v. figs. 5, 6 (1781).

Lycæna optilete, Lang, Butt. Eur. p. 106, pl. xxiii. fig. 3 (1884).

"Expands 0.90 to 1.13 inch. The male has all the wings of rich dark purplish blue, unspotted, with a narrow brown border along the entire length of the hind margins. The female is brown, generally dark blue or purple towards the base; the hind wings have two or three orange spots towards the anal angle. Underside: brownish-grey; fore wings with a crescentic discoidal spot, a central row of six, and a double hind marginal row without any orange; the basal spots are absent. Hind wings slightly blue at the base, with three basal spots, an

elongated discoidal, and an irregular central row; the hind margin has a double row of black spots, three or four pairs enclosing each a spot of bright orange, two or three of the external row nearest the anal angle having a spot of shiny blue or silver.

"*Times of appearance.* June and July.

"*Habitat.* Europe and Siberia, inhabiting peaty or boggy places and mountain sides. Its range in Europe is limited to Germany, Scandinavia, Russia, and the Alps of Switzerland. It does not occur in Western or North-western Europe.

"*Larva.* According to Freyer, pale green, with short reddish hairs, the spiracles marked with white, and the head dark brown or blackish. Its food-plant is *Vaccinium oxycoccos*, on which it feeds in September and October, and again in the spring after hibernation." (*Lang, l. c.*)

There was a female specimen of this species in Pryer's collection which is not referred to in his work. This example differs from the type in being smaller and darker on the under surface; it was probably taken in the mountains of Central Japan or in Yesso.

L. optilete has been recorded from various parts of Amurland, also from Trans-Baikal.

Lycæna pheretes.

Papilio pheretes, Hübner, Eur. Schmett. i. p. 45 (1865).

Lycæna pheretes, Lang, Butt. Eur. p. 112, pl. xxiv. fig. 6 (1884).

"Expands 1.12 inch. Fringes of all the wings white. The male has the wings deep rich violet-blue, with a narrow black border; discoidal spots absent. The female has all the wings uniformly brown in colour, without any markings. The underside is grey, slightly tinged with greenish blue at the base in both sexes. The fore wings have a central row of black spots, and an elongated discoidal surrounded with white. The hind wings have two rows of large white spots without ocelli." (*Lang, l. c.*)

The Western Chinese form of *L. pheretes* differs from the European type in its larger size (34 millim.) and deeper blue colour in the male; the black margins are broader, and there is usually a series of black spots on the outer margin of secondaries. Under surface paler, and the spots are generally less distinct; the white-ringed black spots forming a transverse series on primaries are sometimes very distinct, but often only faintly indicated, and sometimes entirely absent.

The female differs only from European examples of the same sex in being larger.

In India *L. pheretes* is represented by var. *lehana*, Moore, which is smaller and darker than the type, with broader margins to all the wings. The

under surface is also darker, and all the markings more distinct. This form, the type of which was taken at Leh in Ladak, was obtained in some numbers at Kardong and in the Chonging Valley, at elevations ranging from 14,000 to 17,000 feet, in July and August, by Mr. McArthur, who was collecting for me in Ladak in the year 1889. I have also received specimens of this form from the Hindu Kush and Issikul, which approach nearer to the type in colour of upper surface.

Grum-Grshimailo (Rom. sur Lép. iv. p. 389, pl. x. figs. 4 *a*, *b*, 1890) states that *L. pheretes*, var. *lahana*, flies in July at an elevation of about 15,000 feet in the Kounjout Mountains, Pamir.

Elwes (Proc. Zool. Soc. Lond. 1882, p. 402) describes a form of *L. pheretes* from Sikkim under the name of var. *asiatica*, but Mr. de Nicéville (Butt. Ind. iii. p. 81) considers that this form is identical with Moore's *lehana*, and Mr. Elwes has himself stated (Trans. Ent. Soc. Lond. 1888, p. 382) that he has three specimens from Ladak which agree with his var. *asiatica*, and also that he has three pairs from Mongolia and Turkestan which are like European *pheretes*.

Alphéraky (Rom. sur Lép. v. p. 107) records two male specimens of *L. pheretes* from different localities on the borders of Kansou and Szechuen; one of these examples is larger, darker above, and paler beneath than typical *L. pheretes*, and seems to agree with my specimens from Western China, whereas the other specimen, which he says is smaller, darker, and with more distinct markings on the under surface than European *pheretes*, appears to be referable to var. *lehana*, Moore.

Graeser (Berl. ent. Zeit. 1888, p. 78) states that he met with an example of *L. pheretes* at Pokrofska in Amurland, and remarks that it is paler on the under surface than Swiss examples. Staudinger records the species from Trans-Baikal.

My collectors obtained specimens in most of the localities at high elevations in Western China which they visited.

Distribution. Switzerland, the Pyrenees, Norway, Sweden, Lapland, Amurland, Turkestan, Himalayas, Mongolia, Western China.

Lycæna icarus.

Papilio icarus, Rottemburgh, Naturf. vi. p. 21 (1775); Exp. Schmett. i. 1, pl. xxxii. fig. 4.
Papilio alexis, Wien. Verz. p. 184 (1776); Hübner, Eur. Schmett. i. figs. 392-394.
Lycæna icarus, Laug, Butt. Eur. p. 117, pl. xxv. fig. 4 (1884).

Expands 0·75 to 1·14 inch. Fringes of all the wings white, without spots. The male has all the wings deep lilac-blue, with a narrow black border: there is no discoidal spot on the fore wings. Female brown, with an orange hind marginal border on all the wings, the hind wings having a row of black spots: the bases of all the wings are blue, which colour sometimes suffuses the entire wings. Underside pale grey in the male, pale brown in the female. There are the usual spots and orange bands, the fore wings having two basal spots; the hind wings have an elongated white spot towards the middle of the hind margin. The base of all the wings is strongly tinged with blue in both sexes.

“*Larva*. Shaped like those of its congeners [onisciform], green or olive, with the head black: there is a dorsal stripe of a darker shade than the ground-colour, a lateral stripe of lightish green, and on each segment three lateral stripes inclined obliquely from before backwards. Feeds on various low-growing *Leguminosæ*, especially on *Ononis spinosa*.”

“*Pupa*. Dull green, tinged with brown on the wing-cases.” (*Lang, l. c.*)

The life-history of this species is given at greater length in Buckler's ‘Larvæ of British Butterflies.’

In the colour of the upper surface the Chinese male specimens of *L. icarus* agree better with the same sex of *L. hylas*, Esper, from Europe, and the Indian *L. ariana*, Moore. All the males have a series of black spots on the outer margin of secondaries. The ground-colour of the female is rather darker than in ordinary European specimens of this sex, or in the females of *L. ariana*. The under surface in both sexes is darker than in typical European *L. icarus*.

Dr. Staudinger (Rom. sur Lép. vi. p. 162) records *L. icarus* from several places in Amurland, and remarks on its exceptional size and great rarity in that country.

The species is not uncommon at high elevations in the neighbourhood of Ta-chien-lu, and I have received it from Wa-ssu-kou and How-kow. It does not appear to occur in Central China.

With regard to *ariana*, Moore, I think there is little doubt that it is the Himalayan representative of *L. icarus*. Alphéraky (Rom. sur Lép. v. p. 109) records *ariana* from North-eastern Thibet, and remarks that examples from thence do not differ from Himalayan specimens.

A widely distributed species and generally common. It occurs in Europe, Western Asia, Amurland, Western China, and North Africa.

Lycæna felicis.

Lycæna felicis, Oberthür, Étud. d'Entom. xi. p. 21, pl. vii. fig. 52 (1886).

On the upper surface the wings are black as in both sexes of *L. eumedon*. The under surface of

primaries is flaxen-grey, with the usual black dots surrounded with white; the secondaries are thickly powdered with silvery green, or sometimes bluish, scales from the base of the wing as far as the submarginal line, which is composed of small reddish dots placed between the nervules; the outer margin and fringes are pure white.

Expanse 30 millim.

Of this species, which was first discovered by Monseigneur Felix Biet at Ta-chien-lu, I have specimens from almost all the localities in Western China visited by my collectors, and also from How-kow in Thibet. It appears to be on the wing from May to August.

Lycæna eros.

Papilio eros, Oechsenheimer, Schmett. Eur. i. 2, p. 42 (1808).

Lycæna eros, Boisduval, Icones, pl. xiv. figs. 4-6 (1833); Lang, Butt. Eur. p. 116, pl. xxv. fig. 2 (1884).

“Expands 1 to 1.12 inch in the typical form. Fringe of all the wings white. The male has all the wings shining light blue above, without discoidal spots, with a well-defined dark brown hind marginal border, and on the hind margin a row of dark spots. The female is brown; all the wings with a light orange hind marginal band and black spots; fore wings with a black discoidal spot. Underside pale grey in the male, brownish grey in the female, with the usual orange bands and rows of ocellated spots; fore wings with two basal spots; the bases are tinged with pale blue.” (*Lang, l. c.*)

There is an unnamed specimen in the National Collection from Chemulpo, N.W. Corea, which I certainly believe to be this species. It agrees exactly with typical *L. eros* on the upper surface, but the orange marginal band on under surface of secondaries is rather brighter and broader. Alphéraky (Rom. sur Léop. v. p. 78) records a specimen taken in the Bourkhane-Bouddha Mountains in N.E. Thibet, and states that it differs from the ordinary type in the paler under surface, the narrower black margin on the upper surface of the wings, and the absence of black submarginal spots, which are confluent with the marginal border of secondaries in the type.

Bremer records specimens taken by Radde in the neighbourhood of Lake Baikal, Dahuria, and from the Bureja Mountains. Staudinger, however, (Rom. sur Léop. v. p. 162) states that the species has never been subsequently received from Amurland or Trans-Baikal and considers that Bremer's records must be incorrect. He adds that he has only received specimens of *L. eros* from Central Asia and the Altai.

According to Lang this species occurs in mountain pastures in Switzerland and the Pyrenees from June to August.

Lycæna cleobis.

Lycæna cleobis, Bremer, Bull. Acad. Petr. iii. p. 472 (1861); Fixsen, Rom. sur Lép. iii. p. 285 (1887); Lang, Butt. Eur. p. 140 (1884).

Lycæna ægonides, Bremer, Lep. Ost-Sib. p. 28, pl. iii. fig. 8 (1864).

"Alæ supra canescenti-cæruleæ albo-ciliatæ margine late nigro, nervis nigris; apud feminam fusce albo-ciliatæ, canescenti-cæruleo atomosæ. Alæ subtus aut cærulescenti- aut fuscescenti-canæ, antice lunula media punctisque seriei externæ nigris, albo-cinctis; punctis seriei duplicis marginalis nigris; lunulis marginalibus fulvis; postice punctis basalibus quatuor, lunula media, punctis seriei externæ serieique duplicis marginalis, fasciam fulvæ includentis, nigris; punctis seriei marginalis sæpe viridi-micantibus. 32-35 m." (*Brem. Lep. Ost-Sib.*)

"About the size of *L. ægon*. Fringes broad and white; the male has all the wings bluish white, with a rather broad black border, the nervures black; in the female, the wings are brown, powdered with bluish white. Underside bluish or brownish white. Fore wings with a discoidal lunule, a central row of ocellated spots and a double row of hind marginal spots enclosing an orange band. Hind wings with four basal spots and discoidal lunule, a central row and double marginal row enclosing an orange band; this row is often marked with silver as in *L. ægon*.

"Hab. Bureja mountains." (*Lang, l. c.*)

Japanese specimens of *L. cleobis* are larger and lighter blue on the upper surface than the typical form, and the under surface is darker. Korean specimens are also larger than those from Amurland, but they agree with them in colour.

Occurs at Gensan, Corea, in June and July, in the mountain districts of Central Japan, and is not uncommon in Amurland.

Pryer does not mention this species and probably he had confused it with *L. ægon*, from which species, as also from *L. argus*, it may be distinguished by its usually larger size and rounder wings, and by the males being far less suffused with blue.

Lycæna orion.

Papilio orion, Pallas, Reise, i. p. 471 (1771).

Papilio battus, Hübner, Eur. Schmett. i. figs. 328-330, 801, 802.

Lycæna orion, Lang, Butt. Eur. p. 108, pl. xxiv. fig. 1 (1884); Fixsen, Rom. sur Lép. iii. p. 285.

"Expands 0·85 to 1·12 inch. The male has all the wings dark brown, covered with purple scales, excepting along a broad band parallel to the hind margins. Fore wings with a black discoidal spot. Hind wings with a hind marginal row of black spots in light blue rings. Fringes of all the wings spotted with black and white. The female resembles the male but has no purple scales. Underside: the ground-colour is light grey, nearly white. The fore wings have a row of conspicuous black spots on the marginal fringe; internal to this are two

parallel rows of black spots, those composing the inner row being much larger than the external ones; the spots of the central row are large and black, placed somewhat irregularly; internal to this are a large discoidal and two basal spots. Hind wings with a ciliary row of black spots as in the fore wings; internal to this are two parallel rows of large black spots enclosing a light orange band; the central row is conspicuous, and internal to it are a discoidal and six basal spots.

"*Larva*. Bluish green, with a violet dorsal line; it feeds on *Sedum telephium* and perhaps other species of *Sedum*." (*Lang, l. c.*)

I took this species at Gensan, Corea, in July. Dr. Fixsen (*l. c.*), who also records *L. orion* from Corea, states that the specimens are very fine and agree with Amurland examples. Mr. Elwes (Proc. Zool. Soc. Lond. 1881, p. 889) says that it is found at Pekin.

According to Dr. Lang (*l. c.*) this butterfly frequents rocky or stony places in Central Europe, Asia Minor, Armenia, the South of Siberia, and the Amur.

Lycæna lanty.

Lycæna lanty, Oberthür, Etud. d'Entom. xi. p. 21, pl. vii. fig. 53 (1886); Alphéraky, Rom. sur Lép. v. p. 108 (1889).

"Espèce voisine de *hylas* (*baton*), *battus*, *barius*; mais bien distincte par sa taille plus grande, la couleur bleu céleste des ailes dans le ♂ et la ligne de points noirs, marginaux, intracurvulaires qui longe le bord extérieur des ailes. Le dessous ressemble beaucoup à *battus*. La ♀ diffère du ♂ parce que le fond des ailes est noir avec la base des quatre ailes et le bord externe des ailes inférieures saupoudré de bleu." (*Oberthür, l. c.*)

Belongs to that group of the genus *Lycæna* which includes *L. hylas* (*baton*), *L. orion*, and *L. barius*; but distinguished from either of those species by its larger size, the sky-blue colour of the male, and the marginal series of black spots. On the under surface *L. lanty* is very similar to *L. battus*. The female differs from the male in having the ground-colour black, sprinkled with blue at the base of all the wings.

Expanse, ♂ 35-37 millim., ♀ 37 millim.

Alphéraky records a male specimen of this species from Ndami, Amdo, which he states differs from Oberthür's figure in having stronger black spots on both surfaces. M. Grum-Grshimailo has sent me specimens which were taken in the Nian-chan Mountains, Thibet.

Occurs at Ta-chien-lu in May and June at an elevation of 8500 feet, and also at Wa-ssu-kou. At the latter place it appears to be less common than at Ta-chien-lu and is found at 5000 feet.

Lycæna moorei. (Plate XXXI. fig. 9, ♂.)

Lycæna moorei, Leech, Trans. Ent. Soc. Lond. 1889, p. 109, pl. vii. fig. 3.

Male. Upper surface: all the wings smoky black. Fringes of primaries dusky, rather paler at

inner angle; those of the secondaries white, with some darker scales at the extremities of the nervules, giving a slight chequered appearance. Under surface pale grey. Primaries with an elongated discoidal and a central series of six black spots; the last is linear, and all are surrounded with whitish. On the outer margin is a series of black marks more or less V-like in shape; these are bordered on each side with whitish, and precede a black line interrupted by the nervules. Secondaries: three basal spots, that on the anterior margin being large and somewhat triangular in shape, whilst the third is dot-like, and situated on the extreme edge of abdominal fold; an elongated discoidal and a central series of seven spots, the initial one being large and almost round, third and sixth oval—these, as also one between the discoidal and first spot of the central series, are black. A submarginal series of V-shaped black marks, a row of marks, chiefly small and linear, but including one large round spot, edged internally with orange, between the submedian nerve and first median nervule. Fringes grey, with a black line at their base.

Female. Same as male in colour and arrangement of markings, but the spots on under surface are larger, especially those of central series on secondaries.
 Expanse 29 millim.

Though not closely allied to any known species, this insect has a superficial resemblance to *Eeveres (Lycæna) fischeri*, Eversmann, but the absence of any caudal appendage at once separates it from that species. The arrangement of spots on under surface is also very different. From *Taraku (Miletus) hamada*, Druce, which it agrees with on the upper surface, it may be distinguished by the very different maculation of the under surface and the less chequered fringes.

The spots on the under surface vary in size and shape. In one specimen from Kiukiang the spot between the discoidal and first spot of central series is only present on the right secondary.

Occurs in Central China at Kiukiang, from whence the types were received, and more commonly at Chang-yang in June and July. This species has so far not been received from Western China.

Lycæna lycormas.

Polyommatus lycormas, Butler, Journ. Linn. Soc., Zool. ix. p. 57 (1868).

Lycæna lycormas, Pryer, Rhop. Nihon. p. 18, pl. v. figs. 3*a*, 3*b* (1886).

Lycæna scylla, Staudinger, MS., Oberthür, Etud. d'Entom. v. p. 22 (1880).

Lycæna scylla, Staudinger, Rom. sur L'Ép. iii. p. 139, pl. xvi. fig. 7 (1887).

“♂. Alæ supra cæruleæ, nigro marginatæ, ciliis albis. Corpus cæruleo-cinereum; antennæ nigris, albo fasciolatis.

“Alæ subtus pallide cinereæ, basi cæruleo-virides; anticæ serie macularum septem nigrarum albo cinctarum apud marginem posticum. Posticæ apud basim macula una, fascia irregulari punctorum nigrorum albo cinctorum de costa ad marginem posticum currente. Corpus pallide cinereum.

"♀. Alæ supra fuscæ, ciliis albis; corpus cinereo-fuscum; subtus velut nari.

"Alar. exp. unc. 1 $\frac{3}{4}$." (*Butler, l. c.*)

L. lycormas differs from *L. cyllarus*, Rott., in the paler brown colour, broader black margins, and broad white fringes of the upper surface; on the under surface the ground-colour is whiter and the secondaries are less suffused with bluish; the spots are smaller on all the wings and are arranged in more uniformly curved series.

Pryer remarks that he has only seen this species from Yesso, where it was abundant, and he adds that some male specimens are almost as dark as the females. I believe that *L. lycormas* occurs also in the mountain districts of Central Japan.

The specimens obtained by Christoph at Raddefka, Amurland, in June and July, are deeper blue in coloration than the majority of Japanese specimens; but as examples almost exactly identical occur in Japan, it is perhaps hardly necessary to retain the varietal name of *scylla* for the Amurland form as proposed as Dr. Staudinger.

Occurs in Japan and Amurland.

Lycæna celigena.

Lycæna celigena, Oberthür, Etud. d'Entom. ii. p. 21, pl. i. figs. 3 a, b (1876).

"Je ne connais de cette espèce que le mâle. Sa taille est celle de notre *L. arion*. Il est en dessus d'un bleu très brillant et chatoyant. Ses ailes supérieures sont assez largement teintées de noir à l'apex. Cette teinte noire commence par longer le bord antérieur des ailes, puis elle s'épaissit au sommet, et enfin se termine par un mince liséré noir qui se prolonge aux ailes inférieures qu'il borde jusqu'à l'angle anal; la frange est blanche.

"En dessous, la *Lycæna celigena* est d'un gris jaunâtre; aux ailes supérieures, un croissant noir entouré de blanc ferme la cellule discoïdale, et de gros points noirs entourés aussi de blanc précèdent, près du bord extérieur, une rangée de petits croissants plus ou moins apparents et continuant la série bien plus régulièrement marquée de croissants semblables qui suit tout le bord externe de l'aile inférieure. Cette aile inférieure porte aussi un croissant liséré largement de blanc, fermant la cellule discoïdale, et une couronne de points noirs cerclés de blanc.

"Les antennes sont annelées de blanc et de noir." (*Oberthür, l. c.*)

M. Oberthür described the male only; the following is a description of the female:—

Female. Larger than the male. Ground-colour rather darker; outer fourth of primaries and the costa of secondaries black; a marginal series of large black spots on secondaries. Under surface as in male.

Expanse, ♂ 40-46 millim., ♀ 45-48 millim.

This appears to be a rather local species. It occurs commonly at Ichang and Chang-yang, Central China, in May and June, but in Western China my collectors only met with it at Moupin, from which place the type was received by M. Oberthür.

Lycæna pryeri.

Lycæna pryeri, Murray, Ent. Mo. Mag. x. p. 126 (1873); Pryer, Rhop. Nihon. p. 18, pl. v. fig. 16 (1886).

- "Male. Upperside bright violet-blue, costa, tip, and hind margin broadly dark brown; inner margin of hind wing white. A dark brown streak closes the discoidal cell of fore wing. Fringes white. Female similar to the male, but only blue at base and along inner margin of fore wing, the disc being white. The discal portion of hind wing is also whitish, the base being dusky. A blue streak closes the cell of hind wing in this sex; in the male this streak is hardly perceptible. In both sexes the veins of the wings are very distinct; in the female they are edged with bluish scales on the discal portion of the wing.
- "Underside white, with two marginal rows of black spots on each wing; those of inner row of upper wing being the largest, and seven in number. The outer row is composed of about twelve spots. A fine black line occupies the extreme hind margin of both wings. Discoidal cell closed by a brown streak, most distinct on fore wing. Exp., ♂ 22 lin., ♀ 24 lin.
- "Hab. Japan." (Murray, l. c.)

Pryer says this species occurs at Yokohama and in Yesso in May and June. The only specimens that I met with were captured near the summit of Ibuki Yama (Lake Biwa) at about 5000 feet above the sea, in July. Staudinger records *L. pryeri* from various parts of Amurland, and states that the specimens do not differ from those from Japan. Dörries met with the full-fed larva in June on *Syringya amurensis*.

Lycæna euphemus.

Papilio euphemus, Hübner, Eur. Schmett. i. figs. 257-259 (1798-1803).

Polyommatus euphemus, Duponchel, Léop. Fr. Suppl. i. p. 336, pl. l. figs. 4-6 (1832).

Lycæna euphemus, Lang, Butt. Eur. p. 133, pl. xxxii. fig. 4 (1884); Pryer, Rhop. Nihon. p. 198, pl. v. figs. 4 a, 4 b (1886).

Lycæna kazamoto, Druce, Cistula Entom. i. p. 361 (1875).

Lycæna euphemus, var. *euphemia*, Staudinger, Rom. sur Léop. iii. pp. 142-288, pl. xiii. fig. 6 (1887).

- "Expands 1.25 to 1.35 inch. Fringes of all the wings white. Wings blue in both sexes, with a dark brownish-black hind marginal border, broader in the female than in the male; all the wings have a narrow black discoidal spot and a central row of round black spots. Underside brownish grey, with the spots arranged as on the upperside, but in addition to these all the wings have a hind marginal row of black spots, and the hind wings, which are very slightly blue at the base, have two basal spots." (Lang, l. c.)

Var. **kazamoto**, Druce. "Upperside of both wings dark brown, in some lights shot with green, the anterior wing with a dark streak at the end of the cell. Underside pale drab, anterior wing with a dark streak at the end of the cell the same as above, and crossed beyond the middle by a band of six blackish spots curved inwards. Posterior wing with one black spot close to the base and one in the middle of the cell, crossed below the middle by a curved band of eight black spots surrounded with pale greyish white, a submarginal row of very indistinct brown spots common to both wings. Exp. $1\frac{2}{3}$ inch.

"Hab. Yokohama, Japan.

"Allied to *L. fusca*, Brein. and Grey, but quite distinct." (*Druce, l. c.*)

Var. **euphemia**, Staudinger. The male is usually less blue and the spots are longer, in this respect approaching *L. arion*; the female is darker and some examples of this sex are altogether without markings.

This species occurs in the mountainous districts of Central Japan, where it is generally represented by the form *kazamoto*, although some specimens are marked with blue. The examples from Yesso approach nearer to the typical form of *L. euphemus*. At Gensan, in the Corea, the var. *euphemia*, Staudinger, occurs, together with specimens which are not separable from Swiss examples; this form is also recorded by Dr. Fixsen from the north of Peking. Some examples from the north of Peking and one male specimen from Sidemi are stated by Dr. Staudinger to be nearly black and would seem therefore to be referable to the var. *kazamoto*; and I have two aberrant specimens of *L. euphemus* from the Ural which are not separable from that form.

Distribution. Central Europe, Ural, Amuland, Japan, Corea, and N. China.

Lycæna divina.

Lycæna divina, Fixsen, Rom. sur Lép. iii. p. 286, pl. xiii. figs. 5 a, b ♀ (1887).

"Corpore cœruleo, capite antennisque albo-cingulatis nigris. Alis: supra violaceo-cœruleis: anticarum in ♂ limbo maculaque discoidali nigris, in ♀ limbo sat lato in area limbali macularum nigrarum serie, maculis una crassa cellulam extrorsum, duabus minoribus introrsum claudentibus; posticarum in ♂ margine sat lato anteriori nigro, linea limbali nigra et maculis sublimbalibus intercostalibus nigris; in ♀ margine externo multo latiori serieque punctorum limbali intercostalium, introrsum lunulis nigris obducto altera serie punctorum arcuatum cellulam obsediente. Subtus in ♂ et ♀ erectaeis ad basin posticarum cœrulescentibus: anticarum: seriebus duabus macularum nigrarum una limbali minori, altera introrsum posita parallela crassiori, fasciaque macularum nigrarum valde majori nec non maculis cellulam ocludentibus ut supra sed inerassatis; posticarum: fascia limbali fusca, maculis nigris introrsum lunulatis extrorsum minoribus, serieque macularum nigrarum arcuata. nec non stria cellulari maculisque 4 basalibus nigris. Limbo albo in apice nigrescente. Long. alae ant. ♂ et ♀ = 1 $\frac{1}{2}$ millim." (*Fixsen, l. c.*)

Fixsen adds: "like *arion* on upper surface, but more strongly marked, and like *arion* on the under surface with larger spots." He also compares it with *euphemus*, Hübn.

Occurs in Corea, and flies in the beginning of June.

Lycæna chinensis.

Lycæna chinensis, Murray, Trans. Ent. Soc. Lond. 1874, p. 523, pl. x. fig. 5.

Lycæna mandschurica, Staudinger, Rom. sur Léop. vi. p. 160 (1892).

"Wings brown above, with a conspicuous submarginal orange band, equally marked on both wings, and a faint black streak closing the cell. In the fore wing the orange band is divided by the veins into almost square spots; in the hind wing the band is composed of a series of contiguous crescents, seated upon a row of black spots. Fringe white; interrupted by brown. Underside: pale grey-brown, the orange band as conspicuous as above, continuous in both wings. Fore wing: no spot between base and discocellular spot. Beyond middle is a discal row of seven spots, twice bent at a right angle, so that the sixth is immediately below the discocellular spot; the costal spot is small and indistinct. All these spots are white-ringed. The orange band is edged on both sides by a row of spots, the innermost row consisting of larger, but less well-defined spots than the outer. Hind wing: a basal row of four spots, a discocellular spot, and a discal row of eight spots, much curved and angulated, all white-ringed. The orange band is edged as on fore wing by rows of spots, but in this case the spots of the outer row are larger than those of the inner. In both wings the fringe, which is spotted, is preceded by a narrow black line.

"Expands 1" 3".

"This very distinct species is (judging from the markings of the underside) most nearly allied to *Lyc. pylaon*, F., while the upperside reminds one strongly of *L. astrache*." (Murray, l. c.)

Mr. Elwes (Proc. Zool. Soc. Lond. 1881, p. 889) says:—"It is probable that *L. chinensis*, whatever it is, refers to the species which Bremer calls *L. pylaon* in his Pekin list. Dr. Staudinger, however, has never seen *L. pylaon* from any part of Eastern Siberia."

Staudinger (l. c.) records *L. astrache*, v. *allous*, Hübn., from various parts of Amurland, and says that this has nothing to do with his *L. mandschurica*, which he received in some numbers from Herz, who found them from the middle of June to the end of July at Taschiao-sy to the north of Pekin, and which is quite a distinct species from *L. astrache*. *Mandschurica*, he says, agrees on the upper surface with *astrache*, but in one small male specimen the red band is evanescent. All the specimens, however, differ from *astrache*, in any of its forms, in having the fringe equally chequered with white and brownish black. The light grey under surface, which is sometimes slightly tinged with brown, separates this species from *astrache*. The black ocelloid

markings, as also the red-brown submarginal band, agree with those of *L. astrarche*, but the bands in *mandschurica* are less interrupted, and never dentated on their inner edge, as they always are in *astrarche*; *mandschurica* has these bands bordered with shortly curved blackish lunules, and the bands themselves are farther from the outer margin of the wings; the marginal area is broadly grey, and is traversed by a series of black spots. The diffuse white streak found on the under surface of the secondaries in *L. astrarche* is always absent in *mandschurica*, and the sixth black spot of central series is directly beneath the discoidal spot.

A comparison of Staudinger's description of *mandschurica* with Murray's figure and description of *L. chinensis*, which was probably also from the neighbourhood of Pekin, will leave little doubt that both refer to the same species.

Appears to occur only in North China.

Genus PHENGARIS.

Phengaris, Doherty, Journ. Asiat. Soc. Beng. lx. pt. ii. p. 36 (1891).

"The splendid Chinese butterfly *Lycæna atroguttata*, Oberthür, deserves to be placed in a separate genus or subgenus, distinguished from *Lycæna* by the upper discocellular vein of the hind wing being short and angled outwards, the lower discocellular meeting the median vein opposite its second forking.

"This butterfly is certainly the finest of the subfamily, unless the *danis* group of *Cyaniris* be excepted. I was not able to detect any odour about it, but it has all the air of a protected species. I often saw it in the meadows of the Kutcha Naga country, Naga Hills, from 6000 to 8000 feet elevation, flying very slowly, and visible from a great distance, so that I caught a good number, in spite of its rarity. The character of its markings, round black spots on a pure white ground, is very remarkable. It is hard to avoid thinking *Tajuria maculata*, Hew., a mimic of this species, though it seems to live at a lower elevation, and further to the westward. *Taraka hamada* is somewhat similarly marked, and is obviously protected.

"I have taken the name *Phengaris*, which means a *daughter of the moon*, from the modern Greek." (*Doherty, l. c.*)

Phengaris atroguttata. (Plate XXVIII. fig. 5, var.)

Lycæna atroguttata, Oberthür, Etud. d'Entom. ii. p. 21, pl. i. figs. 4a, b (1876).

Phengaris atroguttata, Doherty, Journ. Asiat. Soc. Beng. lx. pt. 2, p. 36 (1891).

- “La *Lycæna atroguttata* est plus grande que *L. caligena*. Le ♂ est en dessus d'un bleu très-pâle, chatoyant, à travers duquel transparaissent les taches du dessous; la ♀ est plus blanche, et les taches du dessous sont effectivement reproduites en dessus, et non pas seulement transparentes du dessous.
- “L'apex aux ailes supérieures et tout le bord externe sont assez largement teintés de noir; les ailes inférieures portent aussi une bordure noire, mais très-mince. La frange est blanche, entrecoupée d'un point noir à l'extrémité de chaque nervure.
- “En dessous, la *L. atroguttata* a les ailes d'un fond blanc un peu bleuâtre. Les ailes supérieures portent un gros point noir qui ferme la cellule discoïdale; en arrière de ce point, dans l'intérieur de la cellule, se trouve une tache noire, et en avant, une bande maculaire et très-sinueuse de six taches, dont quatre sont accolés deux à deux; puis vient une autre bande maculaire suivant, dans l'espace compris entre les nervures, le bord extérieur des ailes; enfin, parallèlement à cette bande, une série de petits traits noirs. Les nervures, en rencontrant le bord externe des ailes, sont marquées par un empatement noir. Il en est de même aux ailes inférieures, qui sont ornées d'abord de deux taches noires dans la cellule, de trois au-dessus et de deux au-dessous de la cellule, puis de trois bandes maculaires, dont la première moins régulière que la seconde, et la troisième composée de taches moins grosses que les deux autres et faisant suite à celle de l'aile supérieure.
- “La ♀, plus largement maculée que le ♂, porte à l'aile supérieure deux ou trois taches de plus.”
(Oberthür, l. c.)

Expanse, ♂ 33-53 millim., ♀ 48-58 millim.

Generally distributed, and common throughout Western China; also occurs in the Naga Hills.

Var. **albida**, var. nov. (Plate XXVIII. fig. 5, ♂.) The wings are white in both sexes, tinged at the base with blue in the male, and bluish grey in the female; the male has the spots on upper surface dark blue and almost as well developed as in the female type.

Expanse, ♂ 58-60 millim., ♀ 46-48 millim.

Occurs with the type at Moupin, but is the only form of the species received from Chia-ting-fu.

Genus CYANIRIS.

Cyaniris, Dalman, Kongl. Vetensk. Acad. Handl. xxxvii. pp. 63, 94 (1816); Moore, Lep. Ceyl. i. p. 74 (1881); Distant, Rhop. Malay. p. 210 (1884); de Nicéville, Butt. Ind. iii. p. 92 (1890).

- “Fore wing elongated, triangular; exterior margin slightly oblique and convex, posterior margin long; costal nervure extending to half length of the margin; first subcostal nervure emitted at nearly one half before the end of the cell, free from the costal nervure; second subcostal at one third, third subcostal at about one eighth before the end of the cell, fourth at one half from the third, and terminating at the apex; fifth from the end of the cell;

disocellular nervules slightly concave; lower discoidal nervule from their middle; discoidal cell long, somewhat narrow, extending to more than half the wing; second median nervule emitted about one seventh before the end of the cell, first median at nearly one half before the end; submedian nervule slightly recurved.

"*Hind wing* oval; apex very acute; costal nervule curved at the base, extending to the apex; first subcostal nervule emitted at one fourth before the end of the cell; upper disocellular nervule the shorter, outwardly oblique, lower disocellular straight, erect, discoidal nervule from their middle; discoidal cell rather short; second median nervule emitted from immediately before the end of the cell; first median at one third before the end; submedian and internal nervules straight.

"Body slender, short; *palpi* porrect, second joint pilose beneath, projecting half beyond the head; third joint slender, and about half its length, naked; *legs* slender, femora slightly pilose beneath; *antennæ* with a lengthened spatular club.

"Type, *C. argyolus*, Linnæus." (Moore, l. c.)

Cyaniris albocæruleus. (Plate XXXI. fig. 13, ♂.)

Polyommatus albocæruleus, Moore, Proc. Zool. Soc. Lond. 1879, p. 139.

Cyaniris albocæruleus, de Nicéville, Journ. Asiat. Soc. Beng. lii. pt. 2, p. 71, pl. i. figs. 4 (male), 4 a (female) (1883); Butt. Ind. iii. p. 98 (1890).

"*Male*. Upperside: both wings pearly white. Fore wing with the outer margin broadly at the apex, and decreasingly towards the hinder angle dusky black, this black border being reduced to a very fine black line at the hinder angle; the base, broadly along the costa and inner margin and within the outer black band pale clear shining blue, thus leaving a patch of the white ground-colour on the disc of the wing only. Hind wing with the base and abdominal half of the wing irrorated with very pale shining blue; the spots of the underside showing through slightly on the disc; an indistinct marginal series of dusky spots, and a fine anteciliary black line. Underside: both wings white, slightly tinted with blue. Fore wing with a slender blackish disocellular streak, a curved discal series of five or six elongate spots, and a marginal series of very indistinct small spots, obsolete at the hinder angle. Hind wing with ten or eleven small dusky spots, of which three are subbasal, the rest arranged irregularly across the disc; a submarginal series of small spots, and a fine marginal black line.

"*Female*. Upperside: fore wing with the costal and outer borders very broadly dusky black, the discal patch white, the inner margin broadly irrorated with blue. Hind wing with the discal area between the nervules bluish white, all the rest dusky; a submarginal series of oval dusky spots, and the marginal black line. Underside: both wings exactly as in the male. Cilia white on both sides in both sexes.

"Expanse. ♂ 1·12-1·50, ♀ 1·35-1·40 inch." (de Nicéville, l. c.)

I took specimens of this species in Satsuma during May 1886, and I have received specimens from Omei-shan, Wa-shan, and Chia-kou-ho in Western China, which do not differ from Sikkim examples. There were also specimens in Pryer's collection from the Loochoo Islands.

It occurs sparingly throughout the Himalayas up to an elevation of 8000 feet, from March to May, and from August to December.

Distribution. Japan, Western China, and N. India.

Cyaniris dilectus. (Plate XXXI. fig. 10, ♂.)

Polyommatus dilectus, Moore, Proc. Zool. Soc. Lond. 1879, p. 139.

Cyaniris dilectus, de Nicéville, Journ. Asiat. Soc. Beng. lii. pt. i. p. 68, pl. i. fig. 5, ♂ (1883); Butt. Ind. iii. p. 107 (1890).

“*Male.* Upperside: both wings pale blue, with a very fine black anteciliary line, which towards the apex of the fore wing in some specimens becomes slightly diffused inwardly. Fore wing with a patch of irrorated white scales on the disc below the cell and between the median nervules, very prominent in some specimens, obsolete in others (as in the Sikkim specimen figured). Hind wing with a similar patch, but placed between the second median nervule and the costal nervule, and almost reaching the apex. Underside: both wings as in *C. alboceruleus*, Moore, but with a more or less prominent submarginal series of dusky lunules.

“*Female.* Upperside: fore wing almost as in *C. alboceruleus*, but the outer margin less broadly black, the basal area glossed with very bright metallic blue, not unmetallic pale lavender-blue as in the latter species, the discocellular streak more prominent. Hind wing with the submarginal series of round dusky prominent spots inwardly defined by bluish lunules. Underside: both wings as in the male.

“Expanse, ♂ 1·00 to 1·40, ♀ 85 to 1·35 inch.” (*de Nicéville, l.c., J. A. S. B.*)

Mr. de Nicéville in his ‘Butterflies of India,’ says:—“In Sikkim this species is slightly dimorphic. The rains form has barely a trace, sometimes none whatever, of the discal white patch, which in the dry-season form is very prominent on the upperside of the fore wing. The markings of the underside of both wings are also more prominent in the rains form.”

I have received specimens from Wa-ssu-kow and Omei-shan, in Western China, and from Kiukiang in Central China, all of which agree very well with specimens from Sikkim.

In India, *C. dilectus* occurs throughout the Himalayas from Simla to Sikkim, and also in Upper Burma and Upper Assam, and its range extends, as referred to above, into Western and Central China.

Cyaniris hersilia, sp. nov. (Plate XXXI. fig. 16, ♀.)

Female. General colour of all the wings white, suffused with bluish-grey scales at the base, neuration marked with black: costa and outer margin of primaries broadly black; costa of secondaries black, and outer margin blackish grey, enclosing a series of white inter-nervular lunules centred with black; there is a distinct black discoidal bar on all the wings. Under surface dirty white, markings similar to those in *C. argiolus*, but fewer in number, and those of the submarginal area of all the wings often entirely absent.

I have received six female specimens from Chang-yang, Central China, where they were taken in June and July.

Cyaniris argiolus.

Papilio argiolus, Linnæus, Syst. Nat. x. p. 483 (1758).

Lycæna argiolus, Lang, Butt. Eur. p. 127, pl. xxxi. fig. I (1884); Pryer, Rhop. Nihon.

p. 18, pl. iv. figs. 25 a, 25 b (1889); Fixsen, Rom. sur Léop. iii. p. 285 (1887).

Lycæna ladon, var.?, Ménétric's, Cat. Lep. Mus. Petr. pt. ii. p. 124, pl. x. fig. 5 (1857).

Lycæna ladonides, de l'Orza, Léop. Jap. p. 20 (1867).

Lycæna levetti, Butler, Ann. & Mag. Nat. Hist. (5) xi. p. 111 (1883).

“ Expands 0·80 to 1·40 inch. Fringes of the fore wings black and white; those of the hind wings white. Wings of the male clear, light blue; fore wings with a very narrow black hind marginal border. The female has the outer half of the costa and all the hind margin of the fore wings broadly brownish black; the hind wings are similarly brownish black on the costa; sometimes the hind margin is also dark brown, and always has a row of black dots. Under-side bluish grey; fore wings with an elongated black discoidal spot, and a row of black spots running parallel to the hind margin; hind wings blue at the base, with an irregular central row, an elongated discoidal and two basal spots. The spots in this species are all black, without white rings.

“ Larva. Dark greenish grey, with a dark green dorsal line. Feeds on the flowers of *Ilex*, *Hedera*, and *Rhamnus* in June and again in the autumn.” (Lang, l. c.)

A very complete life-history of this species will be found in Buckler's ‘Larvæ of British Butterflies and Moths,’ i. pp. 94–100. In addition to the food-plants referred to by Dr. Lang, *Cornus sanguinea* has been mentioned.

Ménétric's seems to have considered that the Japanese form of *L. argiolus* was probably a form of *L. ladon*, Cramer, but de l'Orza having examined the true *L. ladon*, which is a species from the Cape of Good Hope, in Boisduval's collection, came to the conclusion that Cramer's species was very distinct from the Japanese insect, and therefore he gave the latter the name of *L. ladonides*.

Mr. Butler has described Corean *L. argiolus* under the name of *L. levetti*, of which the following is the original description:—

“ Allied to *L. argiolus* and *L. ladonides*. From the former the male differs in the broader and less sharply defined blackish border to the outer margins of the wings and the greyer tint of the under surface; the female differs in its darker tint and broad external blackish border to the secondaries; the costal border is also broader, so that the silvery-blue area is confined to a triangular abdominal patch; below, the white is a trifle less pure, and the submarginal lunules a little better defined than in *L. argiolus*. From *L. ladonides* the male is readily distinguished by its lilacine instead of cerulean colour, and the female by its greyer tint throughout, and its more decided broad blackish external border to secondaries; both sexes

also are decidedly smaller, as in *L. argiolus*, and have the submarginal lunules and spots below much less strongly defined. Expanse of wings, ♂ 30-34 millim. Jinchuen, W. Corea." (*Butler, l. c.*)

All my specimens of *L. argiolus* from Eastern Asia differ from the European type in the greyer coloration of the under surface, which is also without any bluish suffusion, and the marginal black borders are more pronounced on the upper surface. Some of the specimens agree very well with *L. kasmira* Moore (= *cælestina*, Kollar), Proc. Zool. Soc. Lond. 1865, p. 503, pl. xxxi. fig. 1, ♂).

Pryer states that there are several broods of *L. argiolus* in Japan during the year. I found the species common throughout Japan and Corea during the warm season, and noticed that it was as variable in those parts of Eastern Asia as it is in Europe. The same remark applies to specimens from China, where the species is common in all the places visited by my collectors.

In wing-expansion the specimens vary from 27-36 millim., and in the width of the black marginal border of primaries there is considerable diversity.

The Indian *L. huguelii*, Moore, does not appear to me to be specifically distinct from *L. argiolus*, and I think that it, and also *L. cælestina*, Kollar, are really only forms of that species.

A widely distributed and variable species. It occurs throughout Europe and North Asia (except the Polar region), Eastern and Western Asia, Japan, China, the north of Africa.

Cyaniris oreas, sp. nov. (Plate XXXI. figs. 12 ♂, 15 ♀.)

Male. Closely allied to *C. argiolus*, but the blue of upper surface is deeper and more violet in tint. Primaries have a black margin widening towards apex. Secondaries have the costal margin broadly, and the abdominal fold narrowly, black, and there is a series of black spots on outer margin. Fringes white, interrupted with black at the extremities of the nervules on primaries only.

Female. Primaries iridescent blue, with very broad black costal and outer marginal borders; the inner margin is also narrowly black, and there is a short longitudinal black dash at the end of the discoidal cell. Secondaries are black suffused with blue on the central area extending to the base.

Under surface of both sexes whiter than in *C. argiolus*, but the markings are very similar, except that the submarginal lunules are better defined than is usual in that species.

Expanse 38-39 millim.

The female of *C. oreas* bears a slight superficial resemblance to *C. nebulosa*. Occurs at Ta-chien-lu and How-kow at about 10,000 feet.

Cyaniris nebulosa. (Plate XXXI. fig. 18, ♂.)

Lycena nebulosa, Lecch, Entomologist, xxiii. p. 43 (1890).

Male. Lilac-blue, suffused with fuscous. Primaries have some pale blue scales along the costa, and a distinct black discoidal spot; the outer margin is broadly bordered with black, and the central series of spots of the under surface are faintly indicated. Secondaries have all the margins broadly bordered with black. Fringes white. Under surface pale greyish white; linear discoidal spot and central series of spots on primaries black; submarginal series of dark grey lunules, followed by a series of blackish linear spots on the outer margin; secondaries have a basal series of three, and a central series of eight, black spots: discoidal spot is linear and very narrow, the markings beyond are similar to those on primaries, but the spots on the margin in the median interspaces are round and larger; fringes white, streaked with grey, and preceded by a thin blackish line.

Expanse 36 millim.

Female. Primaries blackish; the central area is blue, suffused with blackish. Secondaries blackish, streaked with blue between the nervules; there is a submarginal series of black-centred blue spots.

Expanse, ♂ 38 millim., ♀ 34 millim.

Since describing the male type of this species, which was from Chang-yang, Central China, I have received an example of each sex from Chow-pin-sa, Western China; the male differs from the type in having narrower black borders on primaries, and except a broad streak on the costal area there is no black on secondaries. The under surface is rather greyer than that of the type in both of these specimens from Western China, and the spots are much less distinct.

Genus ZIZERA.

Zizera, Moore, Lep. Ceyl. i. p. 78 (1881); Distant, Rhop. Malay. p. 212 (1884); de Nicéville, Butt. Ind. iii. p. 110 (1890).

•• WINGS small.

•• *Fore wing* elongated, triangular; costal vein extending to half length of the wing; first subcostal branch emitted at one half length before end of the cell and slightly touching the costal nervure near its end, second at one third, the third at one sixth, fourth from half of third, and terminating before the apex, fifth from end of cell; cell long, broadest in the middle: discocellulars slightly oblique in the middle, radial from the centre; middle median branch emitted at one sixth and lower at one half before end of the cell; submedian slightly recurved.

•• *Hind wing* short, oval; costal vein arched at the base, extending to apex; first subcostal at one fourth before end of the cell; upper discocellular shortest, oblique, lower erect, radial from their middle; cell short, broad; two upper median veins from end of the cell; submedian straight; internal vein recurved at base; no tail.

•• Body slender, abdomen long. *Palpi* very long, porrect, second joint projecting more than half

its length beyond front of the head, laxly pilose beneath, third joint long, slender, half length of the second, naked. Antennæ with a stout broad spatular club.

"*Legs* slender.

"Type *Z. alsus*, Fabricius." (*Moore, l. c.*)

Zizera minima.

Papilio minimus, Fuessly, Verz. Ins. p. 31 (1775).

Papilio alsus, Wien. Verz. p. 184 (1776); Hübner, Eur. Schmett. i. figs. 278, 279.

Lycæna minima, Lang, Butt. Eur. p. 128, pl. xxxi. fig. 3 (1884).

"Expands 0.75 to 1 inch. Fringes of all the wings white. Wings dark brown in both sexes. The male slightly tinged with light blue at the bases. Underside pale grey. Fore wings with a straight central row of black spots, and an elongated discoidal spot. Hind wings tinged with blue at the base, with an irregular central row and two basal spots; all the spots are surrounded by light rings.

"*Larva*. Green, with an orange dorsal stripe edged with pale yellow, a lateral yellowish line and an oblique streak. It feeds on several kinds of vetches, as *Anthyllis vulneraria*, *Coronilla varia*, *Astragalus*, &c., in June and August." (*Lang, l. c.*)

All the early stages of *Z. minima* (*L. alsus*) are described at some length in Buckler's 'Larvæ of British Butterflies.'

My collectors obtained this species at How-kow and Ta-chien-lu at an elevation of about 10,000 feet. Chinese specimens are rather larger than European examples. The male is uniformly dark bluish grey and the female is rather more shining black. On the under surface the ground-colour is more bluish white than in European specimens, agreeing in this respect with *L. scbrus*; the black spots are more or less absent.

Grum-Grshimailo obtained this species in Amdo, Eastern Thibet; Graeser states that he met with it somewhat plentifully at Pokrofska, in Amurland, and says the specimens were larger than those from Europe, and the undersides lighter blue-grey with larger and more distinct black spots. It has also been recorded by Bremer from the Bureja Mountains.

Distribution. Europe, Northern and Western Asia, Altai, Amurland, and Western China.

Zizera sangra.

Polygonmatus sangra, Moore, Proc. Zool. Soc. Lond. 1865, p. 772, pl. xli. fig. 8.

Zizera sangra, de Nicéville, Butt. Ind. iii. p. 120 (1890).

Lycæna thibetensis, Poujade, Ann. Soc. Ent. Fr. 1885, p. cli.

"*Male*. Upperside pale purple blue, the exterior margin pale purple-brown. Cilia pale grey. Underside pale grey; fore wing with a blackish white-bordered streak closing the cell, a row

of transverse discal spots, a marginal and submarginal row of lunules; hind wing with markings the same, and with an additional subbasal row of three similar spots. Palpi and body beneath and legs white.

"Expanse $\frac{7}{16}$ ths of an inch." (Moore, l. c.)

Var. **thibetensis**, Poujade.—"Envergure 29 millim. *Mâle*: dessus brun avec la base des ailes sablée de bleu d'outremer brillant jusqu'au-delà des deux tiers aux supérieures, et sur la presque totalité des inférieures.

"*Femelle*. Semblable, sauf la base des ailes qui est à peine saupoudrée de bleu.

"Dessous brun clair marqué comme chez *L. marginata*; les taches discoidales et les points sont noirs et à peine ocellés; ces derniers son plus gros chez la femelle.

"Un mâle et une femelle." (Poujade, l. c.)

The type of var. *thibetensis* was from Moupin, Western China, and I have received examples from the same locality. The specimens are larger than typical *sangra*, and the black markings on the under surface are more strongly defined. My collectors do not appear to have met with it any other part of China. There were some specimens from Loochoo in Pryer's collection, and these agree fairly well with Sikkim examples of *Z. sangra*.

In his remarks on this species de Nicéville (l. c.) says that it varies much in size in different localities, and adds: "I have four definite uniform sizes taken in four different parts of India; some are slightly paler than others, but otherwise all are identical."

Mr. Elwes (Proc. Zool. Soc. Lond. 1881, p. 888) records *Z. (L.) lysimon* from Shanghai, and states that Dr. Staudinger had specimens in his collection from Amoy, Foochow, and Macao. Subsequently, in his remarks on *Z. sangra* from Sikkim, Mr. Elwes appears inclined to consider it synonymous with *Z. lysimon*, Hübner, but states that his specimens of *sangra* from Sumatra, the Andamans, Calcutta, Buxa, and Sikkim seem to be of a paler blue above with a narrower black border than his specimen of *lysimon* from Andalusia, Algeria, and the Canary Islands.

I think that the specimens of *Zizera* from Shanghai referred by Mr. Elwes to *lysimon* are probably *sangra*, which has been recorded from various places in China and also from Formosa and the Loochoo Islands. There are some specimens in Möller's collection which were identified by Mr. de Nicéville as *Z. lysimon*, but curiously there are no specimens of *Z. sangra* in that collection.

Distribution. India, China, Formosa, Loochoo, Malacca, and Penang.

Zizera maha.

Lycæna maha, Kollar, Hügel's Kaschmir, iv. pt. 2, p. 422 (1848).

Zizera maha, Moore, Proc. Zool. Soc. Lond. 1882, p. 245; de Nicéville, Butt. Ind. iii. p. 112 (1890).

Lycæna argia, Ménétriés, Cat. Mus. Petr. ii. p. 125, pl. x. fig. 7 (1857); Pryer, Rhop. Nihon. p. 17, pl. iv. figs. 24 a, b (1886).

Polyommatus chandala, Moore, Proc. Zool. Soc. Lond. 1865, p. 504, pl. xxxi. fig. 5, ♂.

Lycæna japonica, Murray, Ent. Mo. Mag. xi. p. 167 (1874); Pryer, l. c. pl. iv. fig. 24 c.

Lycæna alope, Fenton, Proc. Zool. Soc. Lond. 1881, p. 351.

Lycæna opalina, Poujade, Ann. Soc. Ent. Fr. 1885, p. exliii.

Lycæna marginata, Poujade, tom. cit. p. cli.

"Alis (maris) supra argenteo-cærulescentibus, limbo omni fusco; subtus cinereis, serie punctorum nigrorum in anticis majorum in posticis minorum, punctis omnibus albo-cinctis: femina alis supra fuscis caruleo adspersis. Expans. alar. 10"-12". (Kollar, l. c.)

Larva. "When full-grown about 4 of an inch in length, green, oniseiform, with a dorsal line of a darker green than the ground, the entire upper surface finely shagreened, the minute whitish tubercles giving out very fine short colourless hairs. No distinctive markings whatever. Head smooth, black, shining, as usual. Feeds in Calcutta on *Oxalis corniculata*, Linnæus. *Pupa* very pale green, attached to the underside of the leaves of the food-plant; finely hairy, without markings, of the usual lycænid shape." (de Nicéville, Butt. Ind.)

Lycæna argia, Ménétriés.—"Cette espèce par sa taille et la disposition du dessin de ses ailes, en dessous présente quelque analogie avec *L. optilete*, Fabr., si ce n'est qu'on ne voit aucune tache fauve.

"En dessus, le mâle a ses ailes d'un bleu un peu violet sur la surface, et plus argenté sur le bord antérieur, et à bordure extérieure noire; les ailes postérieures laissent appercevoir, le long de leur bord externe, une rangée marginale de cinq points noirs, surmontés chacun d'un croissant d'un bleu clair ou argenté. Les ♀ sont un peu plus grandes, d'un bleu un peu violet sur la plus grande moitié interne de leur surface, puis brunes et saupoudrées de bleuâtre. (Quoique les ailes soient entières, leur surface est çà et là dépourvue d'écailles; ainsi ces exemplaires ne sont pas en parfaite conservation.)

"En dessous, les ailes sont d'un cendré clair, qui devient blanchâtre vers le bord externe; elles offrent une lunule centrale noire, bordée de blanc, et entre celle-ci et la base, se trouvent un point aux ailes supérieures et trois aux ailes inférieures; la rangée courbe qui se trouve sur le tiers postérieur des quatre ailes, est composée de six points aux ailes supérieures et de huit plus petits aux ailes inférieures; tous ces points sont noirs, bien marqués et bordés de blanc; la double rangée de points sur le bord externe est formée, aux ailes supérieures, de traits épais non arrondis à leur face interne, mais aux ailes inférieures la rangée interne est composée de véritables croissants (chez une femelle ces traits sont en Λ renversé).

"La frange des ailes est blanche, entrecoupée par l'extrémité des nervures qui est noire. Le corps est brun en dessus, blanc en dessous. Les antennes sont noires, auclés de blanc." (Ménétriés, l. c.)

Lycæna japonica, Murray.—"Alis suprâ dilute cæruleis postice brunneo-marginatis: subtus cinereis, nigro-maculatis (maculis albo-marginatis).

“♀. Wings above rather dull blue, with a narrow brown border to hind margin, well defined interiorly. Underside: wings ash-grey; fore wing with a discocellular streak, a spot within cell, another below it faintly indicated, and a transverse row of spots crossing the wing beyond the middle; all these markings are black, and are ringed with white. There are two sub-marginal rows of fuscous rather elongate spots, the exterior very indistinct, and the inner suffusedly white-margined, especially interiorly. A very fine fuscous marginal line before the cilia. Hind wings: a basal row of three spots, a discocellular streak, and a curved and angulated row of eight spots beyond middle; all these black, ringed with white. A double hind marginal row of indistinct fuscous lunules. Fringe dirty white.

“Alar. exp. 1" 2".” (*Murray, l. c.*)

Lycena atope, Fenton.—“Allied to *L. japonica* and *L. argia*. Male deeper violet than *L. argia*. Mētr.: above, the dark marginal border to primaries broader; below, the black spot absent from cell of primaries; the third, fourth, fifth, and sixth of the discal row of spots on the secondaries form an arc of a larger circle than the corresponding one in *L. argia*, the second spot lies much nearer the junction of the first and second subcostal veinlets. Average expanse of wings $1\frac{1}{4}$ line less.” (*Fenton, l. c.*)

Lycena opalina, Pouj.—“Male: envergure 25 mill.—Dessus lilas clair, royeux, blanchissant sur les bords; les quatre ailes bordées d'une double ligne grise, dont l'intervalle est marqué de petites taches de même couleur à l'extrémité des nervures; franges d'un blanc sale. Dessous d'un gris brun clair, avec une double série de taches plus ou moins triangulaires ou chevrons bordant les ailes. Une tache discoidale en forme de chevron borde de blanchâtre limite les cellules. Entre les taches et les bordures, plus près de ces dernières, existe une série de taches ocellées à peu près parallèle aux bords externes; aux ailes supérieures, ces taches sont au nombre de six, noires, assez grosses et inégales; aux inférieures, elles sont régulièrement petites, au nombre de six ou huit, et aussi pales que le fond; de plus, trois taches pareilles, disposées en ligne droite, sont situées à leur base.

“Femelle: envergure 27 mill.—Dessus bleu cendré, avec la côte et l'apex des quatre ailes d'un brun grisâtre se fondant avec le fond; bordures des ailes comme celles du mâle et précédées, aux inférieures, par une série de six taches obscures et vaguement triangulaires. Dessous semblable à celui du mâle, mais plus foncé et plus accentué, surtout aux ailes inférieures, dont les taches ocellées sont noires.”

“Décrit sur trois ♂ et une ♀ de la province Thibétaine de Mou-Pin, rapportés par M. l'Abbé A. David.—Collect. du Muséum.” (*Poujade, l. c.*)

Lycena varginata, Pouj.—“Envergure: de 21 à 23 millim.—Male: dessus lilas foncé; ailes supérieures ayant au bord externe une bordure brune, large de 2 millim. à l'apex et allant en diminuant vers l'angle interne; ailes inférieures à bord costal largement ombré de brun; franges brunes, blanchissant à l'extrémité. Dessous brun clair; les quatre ailes ayant la tache discoidale ordinaire et bordées d'une double série de taches en chevron peu indiquées; les supérieures ont, un peu au-delà des deux tiers, une série de cinq ou six points ocellés d'un brun pâle parallèle au bord externe; les inférieures possèdent également une série de sept ou huit points ocellés limitant parallèlement au bord externe les deux tiers de l'aile, sauf les deux premiers points qui sont reculés jusqu'au milieu du bord costal; deux ou trois taches pareilles occupent la base de l'aile qui est saignée d'argent verdâtre.

“Femelle: dessus brun avec la base des quatre ailes saupoudrée de bleu d'outremer, dessous plus

accentué que celui du mâle. Cette espèce appartient au même groupe que *L. lysimou*, Hübner.

“Decrite sur six mâles et une femelle.” (*Ponjade, l. c.*)

I have specimens of this species from every locality I visited in Japan and Corea, and also from each of the places in China that Messrs. Pratt and Kricheldorff collected in; also a number of Indian examples from Sikkim. With this large amount of material before me I am therefore able to realize something of the extensive variation to which the species is subject, and I have no hesitation whatever in placing *L. argia*, Ménétriés; *L. japonica*, Murray; *L. alope*, Fenton; *L. opalina* and *L. marginata*, Ponjade, as forms of one species, *i. e.*, *Zizera (Lycena) maha*, Kollar. In this opinion I am supported by Mr. de Nicéville, who in his ‘Butterflies of India’ (vol. iii. p. 113), discussing the variation of Indian *Z. maha*, says:—“There is very little doubt in my mind that the ‘*Lycena*’ *argia*, Ménétriés (of which *Z. japonica*, Murray, and *Z. alope*, Fenton, are synonyms), which occurs in China, Japan, and Corea, should be added to the synonymy of this species.” Mr. Elwes (Trans. Ent. Soc. Lond. 1888, p. 380) also holds this view, and adds *L. diluta*, Felder, and *L. similis*, Moore, as synonyms.

The type of *L. japonica*, Murray, is a female, and is said to differ from *argia* in the absence of the marginal spots on the secondaries; but as every gradation is exhibited between specimens of *Z. maha* with the typical markings well developed, and others in which the macular ornamentation of the outer margin of secondaries is entirely absent, the distinction referred to by Murray is of no specific value whatever.

The principal differential characters upon which Mr. Fenton separates his *alope* from *argia*, Ménétriés (= *maha*, Kollar), are (1) the deeper violet colouring, (2) the broader border to primaries, (3) the absence of black spot from cell on under surface of primaries. The colour of *Z. maha* is most variable in intensity, and the width of the marginal border seems to vary in proportion to the depth of the ground-colour. Then with regard to the black spot in the cell on under surface of primaries, I find that this character is a very variable one both in size and definition, and sometimes is altogether absent. I have one specimen in which this spot is present on one wing and absent from the other.

The pale males with narrow borders are usually referred to var. *japonica*, with which *opalina*, Ponjade, is synonymous; these appear in the spring and

autumn, and var. *alope* (= *marginata*, Poujade), is on the wing in the summer.

Common in some of its forms throughout India, China, Corea, and Japan.

Genus EVERES.

Everes, Hübner, Verz. bck. Schmett. p. 69 (1816); Moore, Lep. Ceyl. i. p. 85 (1881); Distant, Rhop. Malay. p. 221 (1884); de Nicéville, Butt. Ind. iii. p. 136 (1890).

“FORE WING elongate, triangular; costa slightly arched at the base, apex rounded, exterior margin slightly oblique and convex, posterior margin long; costal vein short, bent slightly upward before reaching the costa, and not extending to half length of the margin; first subcostal branch ascending and anastomosed to costal near its end, second at one third before end of the cell, third at one sixth before its end, fourth from one half length of the third and terminating at the apex, fifth from end of the cell; discocellulars slightly oblique, radial from their middle; the middle median emitted at one sixth before end of the cell, lower at one half before its end; submedian slightly recurved.

“HIND WING oval: with a slender tail from end of lower median vein; costal vein extending to near apex, arched at the base; upper discocellular oblique, lower erect, radial from their middle; cell short; middle median branch emitted before end of the cell, lower at one half before its end; submedian and internal veins straight.

“BODY small, short; *palpi* slender, porrect, second joint pointed at its end and clothed with longish scales at its base beneath, third joint long, slender; antennæ with a slender grooved club.

“Legs slender.

“Type *E. amyntos*, Fabricius [= *argiades*, Pallas]. (Moore, l. c.)

Everes argiades.

Papilio argiades, Pallas, Reise, i. p. 472 (1771).

Lycæna argiades, Lang, Butt. Eur. p. 101, pl. xxii. fig. 5 (1884); Pryer, Rhop. Nihon. p. 17, pl. iv. figs. 23 a, b (1886).

Everes argiades, de Nicéville, Butt. Ind. iii. p. 137, pl. xxvi. fig. 180, ♂ (1890).

Lycæna hellotia, Ménétrics, Cat. Mus. Petr. ii. p. 124, pl. c. fig. 6 (1857).

“Expands 0·80 to 1·12 inch. Hind wings with a short tail. The male has all the wings violet-blue, with a narrow brown hind marginal border; the fore wings are without spots; the hind wings have two or three small brown spots along the hind margin, near the anal angle. The female is brown, slightly tinged with violet-blue at the bases; the hind wings, besides having two or three black spots near the anal angle, show faint traces of an orange band. The fringes in both sexes are white. Underside greyish white, tinged with blue at the base; all the wings have a faint hind marginal orange band. The fore wings have a narrow linear discoidal spot, and a row of seven black spots enclosed by the orange band, and an irregular row running across the central area of the wings, besides two placed near the base.” (Lang, l. c.)

Dr. Lang states that the larva is pale green, with darker dorsal and lateral streaks, and light brown and white spots. It feeds on trefoil and other *Leguminosae*.

Lycæna bellotia, Ménétriés.—“D’après un individu de 14 lignes d’envergure.

“En dessus, il est d’un brun très foncé, présentant à la base un reflet bleu; sur l’angle anal des secondes ailes, un point noir surmonté d’un croissant fauve.

“En dessous, il est d’un blanc brillant, un peu bleuâtre; les ailes supérieures n’ont pas de traits ou points à leur base, et le trait discoidal très peu visible; puis, derrière celui-ci une ligne de six traits noirs forts marqués, et près du bord externe on ne remarque que la trace de deux ou trois traits bruns, marqués de fauve extérieurement, et placés près de l’angle interne. Les ailes inférieures présentent deux points noirs placés plus près de la base que du disque, mais on n’apperoit aucune trace de croissant discoidal; puis au-delà une rangée transversale de points très noirs, disposés en ∞ , dont deux près de l’angle externe, quatre autour du disque et trois, plus bas, près de l’angle anal; enfin sur le bord externe, et vers l’angle interne, sont deux points noirs, surmontés chacun d’une tache fauve, limitée supérieurement par un trait noir très étroit, et plus extérieurement, toujours sur le bord marginal, deux faibles traces de fauve.” (*Ménétriés, l. c.*)

The above description refers to a specimen taken by M. Goschkevitch in Japan, and is apparently a worn female of *E. argiades* bereft of tails.

Pryer says that the species occurs in Japan from March to October.

I have received specimens from all the localities in China visited by my collectors. The small var. *polysperchon*, Bergstrasser, is of common occurrence, but I have not seen the var. *coretas*, Oehsenheimer, from any eastern locality. Some male specimens taken by myself in Japan have red lunules on upper surface of secondaries as in the females. Nagasaki specimens attain a wing-expansion of $1\frac{1}{2}$ inch. It is also common in Amurland and Corea.

Everes argiades is very widely distributed. It occurs in North America, South and Central Europe, almost throughout Asia, and has been found in Australia.

Everes arcana. (Plate XXXI. fig. 1, ♀.)

Lycæna arcana, Leech, Entomologist, xxiii. p. 43 (1890).

Male. Brown; secondaries with a slender short black tail fringed with white; discoidal spot of primaries black; discal area suffused with pale blue, as also is the basal area of secondaries, which is further adorned with a submarginal row of black spots, the last two bordered internally with orange, and externally with whitish. Under surface pale grey; discoidal spot, central, and submarginal lines of primaries dark grey, bordered with white. The secondaries have three black basal spots; discoidal spot and central line dark grey, bordered with white; the line is much interrupted, especially towards the costa, and is represented on the costa itself by a black spot outlined with white; submarginal line wavy dark grey, and

preceding a series of triangular spots of the same colour on the outer margin; two black spots towards anal angle, edged outwardly with metallic blue and inwardly with orange.

Female. Similar to male, but without the blue suffusion.

Expanse, ♂ 31 millim., ♀ 33 millim.

One male, Chang-yang, June; one female, Ship-y-Shan, September.

Allied to *L. argiades*, but differs therefrom in the ornamentation of under surface.

Everes fischeri.

Lycæna fischeri, Eversmann, Bull. Mosc. (1843) iii. p. 537; Oberthür, Etud. d'Entom. v. p. 20 (1880); Laug, Butt. Eur. p. 112, pl. xxiii. fig. 6 (1884); Fixsen, Rom. sur Lép. iii. p. 284 (1887).

Male. All the wings dark brown. The primaries have a small blackish discoidal spot, and the minutely tailed secondaries have a submarginal series of ill-defined pale spots. Fringes white. Under surface pale greyish; primaries have a black discoidal spot surrounded with whitish; beyond is an irregular transverse series of fairly large black spots, and there are two rows of smaller black spots parallel with outer margin, these spots are encircled with whitish; secondaries have four basal spots and a linear discoidal spot, beyond there is an irregular central series of black spots, which, together with the discoidal spot, are ringed with whitish, and two marginal rows, the latter enclose a faint orange band, and the spots near anal angle are powdered with silvery blue.

Female similar to the male, but the pale submarginal macular band on secondaries is more distinct and marked with orange in the median interspaces.

Expanse, ♂ 23-26 millim., ♀ 26-28 millim.

I found this species in July at Gensan, Corea, but it seems to be rare. A female specimen is also recorded by Dr. Fixsen from Corea. M. Oberthür mentions it from the Isle of Askold, and says that it occurs there in June and August, and that the specimens are larger than those from the Altai. Staudinger (Rom. sur Lép. vi. p. 158) records *E. (L.) fischeri* from various parts of Amurland, the Ural, Saïssan, Corea, and China.

Everes zuthus, sp. nov. (Plate XXXI. fig. 7, ♂.)

Male. Fuliginous, with some large velvety-black spots parallel with outer margin of secondaries; these spots are more or less completely encircled with bright blue. Fringe white, chequered with fuliginous on the primaries. Under surface greyish white; the primaries have a discal spot, and beyond this is a transverse series of seven black spots encircled with white, the third spot is more oval in shape than the others and placed crosswise; the blackish submarginal band is interrupted by the whitish nervures and bordered on each side with white; secondaries have four black basal spots encircled with whitish, an ochreous-grey central spot and angular macular band; the narrow whitish submarginal line is preceded by a series of greyish lunules, and followed by a series of greyish spots, of these the fifth is marked with orange and metallic

blue: the sixth is marked in a similar way, but has a black dot in addition; the fringes of all the wings are greyish white preceded by a black line.

Female. Similar to the male, but with traces of orange markings towards anal angle of secondaries in some examples.

Expanse 23-32 millim.

Allied to *E. fischeri* and *E. ion*, but is distinguished from the former species by the bright blue markings on upper surface of secondaries and the chequered fringes of primaries, and from both by the different character of ornamentation on the under surface.

Occurs at several places in Western China, in July and August, at altitudes ranging from 5000 up to 8500 feet.

Everes ion. (Plate XXXI. fig. 4, ♂.)

Lycæna ion, Lecch, Entomologist, xxiv., Suppl. p. 58 (June 1891).

Agrees almost exactly with *L. fischeri*, Eversm., on the upper surface, but the under surface of secondaries presents the following differences: the ground-colour is much whiter; there are three or four patches of grey near the base; the central band is uninterrupted, grey in colour, contains a whitish spot, and has a spur from its outer edge to a grey band on the outer margin; this latter is intersected by a whitish transverse line; there are no orange markings on the outer margin, but there are some silvery scales and a small black spot above anal angle.

Expanse 28-30 millim.

Occurs in Western China at Wa-shan, Wa-ssu-kow, Chow-pin-sa, Chia-kou-ho, and Ta-chien-lu, in June and July, at elevations ranging from 5000 to 8500 feet.

Everes filicaudis. (Plate XXXI. fig. 6, ♂.)

Lampides filicaudis, W. B. Pryer, Cistula Entom. ii. p. 231 (1877).

“Upside: ground-colour smoky brown-black, alike in both sexes, the only markings being a just discernible submarginal row of spots on the hind wing, faintly edged with slaty blue.

Underside slaty grey, the usual *Lycæna*-like spots large, black, well-marked, and narrowly edged with white. The tail is very diminutive, and hardly distinguishable, except in newly emerged specimens; the space between the two anal spots of the marginal and submarginal rows of spots is more or less orange.

“Expanse of wings 10 lines to 1 inch.” (*Pryer, l. c.*)

On the under surface, the basal spots and interrupted arrangement of the spots forming central series on primaries, together with the lesser amount of orange on the outer margin of secondaries, distinguish this species from *L. fischeri*, to which it is otherwise very similar.

Mr. W. B. Pryer states that this species is abundant in all the hilly districts of North China, and that from its resemblance to the females of some

of the commoner Lycenidæ it is probably overlooked. It rests on the sides of bare rocks.

I have taken it at Ningpo in April, and my collectors obtained it at Changyang and Kiukiang, Central China, and at Omei-shan and Chow-pin-sa, Western China, in May and June.

Everes davidi. (Plate XXXI. fig. 3, ♂.)

Lycæna davidi, Pojard, Ann. Soc. Ent. Fr. 1884, p. cxxxv.

“ Envergure : 25 mill.—Dessus brun très foncé, les ailes inférieures avec une petite queue et le bord externe bordé de petites lunules gris perle. Dessous blanc terne, avec des taches noires disposées comme dans *L. fischeri*, Ev., mais non cerclées, et deux taches en plus à la base des ailes supérieures.” (*Pojard, l.c.*)

This species is easily distinguished from *E. flicaudis* on the under surface by the whiter ground-colour and the different arrangement of the spots forming the central band on primaries.

Apparently a very scarce species, as I have only one male specimen, which was taken in June at Moupin, from whence the type was also received.

Everes potanini. (Plate XXXI. fig. 2, ♂.)

Lycæna potanini, Alphéraky, Rom. sur Léop. v. p. 104, pl. v. fig. 4, ♂ (1889).

Everes umbricel, Doherty, Journ. Asiat. Soc. Beng. lviii. pt. 2, p. 433, pl. xxiii. fig. 1 (1889).

“ Palpi perlongi supra fuscis (articulo terminali ubique fusco) subtus albi; oculi nudi; alæ posticæ rotundatæ cauda tenuissima munitæ. Alæ supra fuscæ, subtus fusciscenti-cenæ; anticæ fasciis duabus paginæ externæ interruptis, seriæbus duabus punctorum antemarginalium strigaque venæ transversæ cellule fusciscentibus albido circumductis; alæ posticæ punctis duobus superpositis ad basin, fascia angusta media (supra interrupta), fasciis duabus (interruptis) paginæ externæ (altera subcostali, altera inter venas 4 et 7 sita) fusciscentibus albido circumductis; fascia undulata antemarginali serieque punctorum marginalium (quorum duo inter venas 3 et 5 fulvo marginata) fuscis. Puncta marginalia inter venas 3 et 5 sita strigaque anguli anali cæruleo (metallice) atomata; venam contra tertiam caudula tenuissima fusca albo-terminata. ♂ = 23 mm. Un ♂ pris, le 3 Septembre, 1885, à Pikouà.” (*Alphéraky, l.c.*)

Female rather larger than the male, but agrees with that sex in colour and marking.

E. umbricel, Doherty.—“ Male, above black, the cilia of the hind wing and of the lower angle of the fore wing whitish, except at the ends of the veins. Below grey-white (much whiter than in *E. kaizi*) with the following blackish markings, the discal ones quadrate. Fore wing with a streak across the end of the cell, a broad, straight, transverse discal band, inwardly dislocated below the middle median, the lower part outwardly oblique, outer margin widely dark, containing an inner lunular and an outer slender whitish fascia. Hind wing with large

subcostal, a smaller cellular, and a minute abdominal spot all near the base, a streak across the end of the cell, and a broad discal transverse band broken into four quadrate masses, of which only the upper two touch each other, the first covering two spaces, the second (strongly dislocated outwardly) three, and the third (nearer the base, oblique) two; the fourth being a small lunule between the submedian and the internal veins. Outer margin broadly dark, containing a row of whitish lunules (the subanal one orange) surrounding black spots, of which the two subanal ones are touched with metallic green. A whitish submarginal and a black marginal line, both very slender, the cilia and the tip of the tail white." (*Doherty, l. c.*)

Mr. Doherty adds:—"I took two males of *umbriel* in the Tenasserim Valley, and observed one or two others." Mr. Elwes has specimens in his collection, taken by Doherty in East Pegu at an elevation of 4500 feet in March and April. These examples agree exactly with Chinese specimens of *E. potanini*.

This species appears to be not uncommon at Moupin and Chow-pin-sa, Western China. It occurs in June at an elevation of about 5000 feet. The type is from the Province of Kan-son.

As will be seen on referring to the figure, *potanini* is very different on the under surface to any other described species of *Everes*.

Genus JAMIDES.

Jamides, Hübner, Verz. bek. Schmett. p. 71 (1816); Moore, Lep. Ceyl. i. p. 86 (1881); Distant, Rhop. Malay. p. 222 (1884); de Nicéville, Butt. Ind. iii. p. 156 (1890).

"FORE WING elongate, triangular; costa slightly arched at base, apex very acute, exterior margin slightly oblique and convex, posterior margin long; costal vein bent upward near its end to the costa, extending to half length of the margin; first subcostal branch short, emitted at nearly one half before end of the cell, and slightly touching the costal at its angle, second branch at one third before end of the cell, third close to the end; fourth at nearly one half from third, and terminating at the apex, fifth from end of the cell; discocellulars slightly waved, radial from their middle; cell broad, long, extending to more than half the wing; middle median branch emitted at one sixth before end of the cell, lower at nearly one half before the end; submedian straight.

"HIND WING short, triangular, with a slender tail from end of lower median vein; costal vein arched and extending to apex; discocellulars slightly oblique, radial from their middle; cell short, broad; middle median branch emitted before end of the cell, lower at nearly one half before the end; submedian straight, internal recurved.

"BODY slender, short. *Palpi* porrect, second joint projecting half length beyond the head, clothed with adpressed scales, third joint naked, slender, about half length of second. *Antennæ* with a thick club.

"*Legs* slender." (*Moore, l. c.*)

Jamides bochus.

Papilio bochus, Cramer, Pap. Exot. iv. p. 210, pl. ccxcxi. figs. C, D, ♂ (1782).

Jamides bochus, Hübnér, Verz. bek. Schmett. p. 71 (1816); Moore, Lep. Ceyl. i. p. 85, pl. xxxvi. figs. 8 ♂, 8 a ♀ (1881); Distant, Rhop. Malay. p. 222, pl. xxi. figs. 19 ♂, 16 ♀ (1884); de Nicéville, Butt. Ind. iii. p. 157 (1890).

“*Mal.* Wings above bright metallic blue: anterior wings (excepting a basal space occupying the lower half of wing beneath cell, and not extending beyond extremity of cell) black; posterior wings with the costal, outer and abdominal margins black, and with some indistinct anal angular spots. Wings beneath pale brownish; anterior wings crossed on outer half by two series of greyish linear fasciæ, which terminate near the upper median nervule, and are then continued by a third series which commences between them and terminates near inner margin, and with a marginal and two submarginal series of greyish linear fasciæ. Posterior wings with two series of irregular and broken greyish linear fasciæ, which are apparently arranged in subbasal and discal series; a third series beyond disk; two submarginal wavy linear fasciæ and a narrow marginal fasciæ of the same colour; a large black marginal spot bordered with reddish ochraceous between the first and second median nervules, and a smaller spot of the same colour irrorated with bluish scales at anal angle. Body above and beneath more or less concolorous with wings.

“*Female.* Wings above bright but non-metallic blue; anterior wing with the costal and outer margins broadly (broadest at apex) blackish; posterior wings with the costal and abdominal margins fuscous, the posterior margin narrowly black, with two submarginal wavy fuscous linear fasciæ, and a large marginal black spot inwardly bordered with bluish between second and third median nervules. Wings beneath paler in hue, but marked as in male.

“Exp. wings, ♂ 22-27 millim., ♀ 28-32 millim.” (*Distant, l. c.*)

I have one specimen of each sex from Chang-yang, Central China, and these are almost identical with some Sikkim examples, and agree with Mr. Distant's description of the species.

Referring to *Jamides bochus*, Mr. de Nicéville says:—“As regards coloration the male of this species is perhaps the most lovely of the Indian ‘blues,’ its brilliancy rivalling some of the South-American species of *Morpho*. It is a common and widely distributed species, occurring all along the low outer valleys of the Himalayas, but not in the desert region of Sind, throughout continental and peninsular India, in Ceylon, the Andaman Isles, and on Kamorta, Nankowri, Katschall, Trinkutt, Teressa, and Great Nicobar Islands, in Assam, Burma, the Malay Peninsula, Java, Sumatra, Formosa, and Australia. In Ceylon, Mr. Hutchison states that it ‘has a quick flight, darting from point to point among hedges on the roadside, and settling on the leaves.’ This I can confirm; in Calcutta it seems invariably to frequent trees and bushes, and always settles with closed wings. As it flashes past and suddenly settles on a leaf with its dull-coloured underside exposed, the disappearance of such a brilliant little object is somewhat startling.”

Genus CATOCHRYSOPS.

Catochrysops, Boisduval, Voy. Astrolabe, Lép. pl. i. p. 87 (1832); Moore, Lep. Ceyl. p. 90 (1881); Distant, Rhop. Malay. p. 223 (1884); de Nicéville, Butt. Ind. iii. p. 175 (1890).

- “FORE WING triangular; costal nervure extending half the wing, bent upwards to the costa near the end; first subcostal nervule emitted at nearly one half before the end of the cell, curved upwards and slightly touching the costal nervure; second subcostal emitted at one third, third subcostal at one eighth before the end of the cell, fourth subcostal at two thirds from the base of the third, and terminating at the apex, fifth subcostal from the end of the cell; discocellular nervules slightly concave; discoidal nervule from their middle; discoidal cell narrower than in the genus *Nacaduba*, Moore, extending to half length of the wing; second median nervule from immediately before the end of the cell, first median at one half before the end.
- “HIND WING short, triangularly oval; abdominal margin long; furnished with a single slender tail; costal nervure much arched; first subcostal nervule slightly curved, emitted at one fourth before the end of the discoidal cell; discocellular nervules obliquely recurved; discoidal nervule from their middle; discoidal cell broad; third and second median nervules from the end of the cell, first median at one half before the end; submedian nervure straight, internal nervure recurved.
- “BODY moderate. *Palpi* porrect, second joint laxly squamose, third joint long, slender. *Antennal club* rather short, grooved.
- “*Legs* slender.
- “Type *C. strabo*, Fabricius.” (Moore, l. c.)

Catochrysops cnejus.

Hesperia cnejus, Fabricius, Ent. Syst. Suppl. p. 430 (1798).

Lycena cnejus, Horsfield, Cat. Lep. Mus. E. I. C. p. 83 (1829).

Catochrysops cnejus, Distant, Rhop. Malay. pp. 225, 456, pl. xxi. fig. 2, ♂, pl. xlv. fig. 15, ♀ (1886); de Nicéville, Butt. Ind. iii. p. 178 (1890).

- “Ale supra feminae ad basin. anticae usque ad discum latè eaurulae, argenteo nitidae, limbis exteriore et posteriore fuscis; posticae serie punctorum ocellatorum, ocellis duobus analibus saturatoribus rufo annulatis, penultimo insigniore, omnibus posticè abruptè terminatis; huic serie parallèle, ad marginem interiorem limbi, maculae quinque euneatae, acumine introrsum spectante, in serie transversâ ordinatae; subhis canae in flavescentem vergentes, singulae stigmate brevi in disco fasciisque transversis catenulatis albo marginatis; fasciae in anticae duae margini postico approximatae tertia saturatorum margini discoeque intermedia, haec per alas posticas ducta ex fragmentis brevibus et in regioni anali ex arebus interruptis efformatur; ocelli anales in posticis duo insignes aequales nigerrimi circulo aureo-irrorato marginali cineti lunulaeque aurantiâ induti; punctis insuper quatuor nigerrimis albo annulatis, tribus in serie basilari digestis, quarto marginali ad medium costae.
- “Exp. alar. 1 unc. 1 lin.
- “*Female*. Wings above with a deep browu border; a light blue tint with a bright silvery

reflection is, in the hinder wings confined to the base, in the fore wings expanded to the disc, but entirely evanescent in a certain position towards the light; posterior border of the hinder wings bearing a series of dark ocellate spots, of which two at the anal angle are of a deeper tint and surrounded internally with bright rufous crescents; the penultimate ocellus exceeds the last in size and brilliancy of colour; all these ocelli are abruptly truncated behind, and the exterior ones are surrounded internally with narrow white crescents; a row of angular or wedge-shaped marks of a brilliant white, having the points directed towards the disc, passes along the inner edge of the marginal series; the cilia are grey; underneath the wings are grey with a faint isabella-yellow shade; each pair is marked on the disc with a short transverse stigma, which in the hinder ones is slightly curved; the anterior wings have further three ranges of eutelated bands of a brown colour, of which the two exterior are parallel with and adjoining the posterior margin, being confined by the marginal strigæ; the third, in which the eutelated character is more distinctly exhibited, is intermediate between the marginal series and the disc; this is continued through the hinder pair, where it is more curved and somewhat irregular and inflected in its course; in the marginal series of ocellate spots, the interior ones form two strongly marked anal ocelli: these are regularly round, nearly equal in size and brilliancy of tint, intensely black, encircled by a pale orange iris, bordered internally by a ring of yellow metallic irrorations, which is partially interrupted at the internal edge: the hinder wings have further four ocellate spots of an intense black colour with white iris, three of these are placed in a transverse series at the base, and a third, somewhat larger and more vivid, in the middle of the anterior margin close to the costa. The thorax above has a bluish cast, and is covered with delicate hairs; the abdomen is brown; underneath the thorax and legs are covered with a delicate pure white down, and the abdomen agrees in colour with the wings; the antennæ are banded with white." (*Horsfield, l. c.*)

"Larva when full-fed about half an inch in length, green, of the usual lycenid-shape, the head small, black, shining, retractile as usual. Colour of body pale green, with darker green or reddish dorsal and subdorsal lines, often with short oblique lines one on each segment on each side between the dorsal and subdorsal lines, the latter coalesced into a broad band between the eleventh and last segments. The entire surface of the body covered with minute white tubercles, there are also a few scattered white hairs. The segmental constrictions shallow. Spiracles black. Extensile organs on the twelfth segment small. The larva is broader than high in its highest part, increasing in width to the fourth segment, from thence to the flattened anal segment of about uniform width. Bred by me in Calcutta on *Phaseolus trilobus*, Linnaeus." (*de Nicéville, l. c.*)

According to Mrs. Wylie, as quoted by de Nicéville (*l. c.*), the larvæ vary in colour; some are yellowish green, others uniform pale green, and others again are dark red-brown. "The food-plant is an edible bean (*Dolichos catjang*) growing in the rains, with clusters of bluish flowers," and the larvæ feed on the flowers and buds.

I received one specimen from Ta-chien-lu, Western China, where it was taken at an elevation of over 7000 feet. It is rather larger than Darjiling specimens; the outer margins are more broadly bordered with black, and the discoidal spot of primaries is more distinct.

Mr. de Nicéville places *C. patala*, Kollar, as a synonym of *Catochrysops*

enejus, and is of opinion that *C. theseus*, Swinhoe, *C. ella*, *C. contracta*, and *C. hapalina*, Butler, are not specifically distinct from that species.

Generally distributed throughout the Indo-Australian Region, its range extending into Western China.

Genus POLYOMMATUS.

Polyommatus, Latreille, *Sonnerat's Buffon*, xiv. p. 116 (1805); Moore, *Lep. Ceyl.* i. p. 93 (1881); Distant, *Rhop. Malay.* p. 230 (1884); de Nicéville, *Butt. Ind.* iii. p. 203 (1890).

“FORE WING triangular, costa slightly arched, exterior margin oblique and slightly convex towards the apex, posterior margin straight; costal vein extending to half length of wing; first and second subcostal branches short, first emitted at nearly one half before end of the cell, second at one fifth, third bifid and emitted close to end of the cell, fourth at one half from third, and terminating at the apex, fifth from end of the cell; discocellulars nearly erect, of equal length, radial from their middle; cell broad, extending to a little beyond half length of wing; upper median from end of the cell, middle branch at one fifth and lower at one third before end of the cell; submedian nearly straight.

“HIND WING bluntly oval; furnished with a single slender tail; costal vein much arched from the base; first subcostal branch curved, emitted at one fourth before end of the cell; discocellulars very slender, upper slightly concave, radial from their middle; two upper median branches from end of cell, lower branch at one third before the end; submedian straight, internal recurved, short.

“BODY stouter than in *Lampides*.

“*Palpi* porrect, long, slender, flattened, fringed beneath. Antennal club stout, grooved.

“*Legs* slender.

“Type *P. bœticus*.” (*Moore, l. c.*)

Polyommatus bœticus.

Papilio bœticus, Linnæus, *Syst. Nat.* xii. p. 789 (1767).

Polyommatus bœticus, Godart, *Enc. Méth.* ix. p. 633 (1823); Distant, *Rhop. Malay.* p. 230, pl. xx. figs. 8 ♂, 1 ♀ (1884); de Nicéville, *Butt. Ind.* iii. p. 204 (1890).

Lycæna bœtica, Lang, *Butt. Eur.* p. 99, pl. xxii. fig. 2 (1884); Pryer, *Rhop. Nihon.* p. 17, pl. iv. fig. 12 (1886).

“*Male*. Wings above pale violaceous; anterior wings with the costal margin narrowly, and the outer margin more broadly pale fuscous; posterior wings with the costal and posterior margins pale fuscous, a large black marginal spot between second and third median nervules, and two contiguous smaller black spots at anal angle. Wings beneath pale brownish ochraceous, with the following linear brownish fasciæ margined with greyish:— anterior wings with two crossing centre and two near end of cell, two (considerably fractured), crossing wing between end of cell and outer margin, commencing near the fourth subcostal nerve and terminating at submedian nerve, two submarginal (the innermost

broadest), and the outer margin narrowly pale fuscous; posterior wings crossed from base to beyond middle with about eight linear fasciæ as on anterior wings (more or less fused and broken), followed by a distinct and somewhat broad greyish fasciæ, and with two submarginal linear brownish fasciæ; two large marginal spots containing a few scattered greenish scales and inwardly margined with pale reddish ochraceous, separated by the lower median nervule; outer margin narrowly fuscous; fringe of both wings pale brownish, the tips greyish white. Body above more or less concolorous with wings, beneath with legs greyish white; legs more or less streaked with brownish.

"*Female*. Wings above pale brownish; anterior wings with a discal bluish patch; posterior wings with two outer greyish submarginal fasciæ, the innermost broadest; black anal angular spots as in male, distinctly margined with greyish; wings beneath as in male.

"Exp. wings, ♂ & ♀, 30 to 38 millim." (*Distant, l.c.*)

"*Larva* when full-grown measures $\frac{7}{8}$ of an inch in length; pale dull green throughout, slightly shagreened, but not hairy, except slightly so at the sides; the small retractile head smooth, ochreous pale brown, shining; a dorsal line of a somewhat darker green than the ground, no other markings whatever, altogether a very plain-looking creature: the constrictions at the segments shallow, the spiracles black but inconspicuous, the extensile organs on the twelfth segment very short; feeds on the yellow pea-like flowers and on the pods of *Crotalaria striata*, DC., in Calcutta. *Pupa* pale yellowish green, the posterior end very blunt and rounded, the abdominal segments larger than the anterior, the head small, a dark dorsal line, a double subdorsal series of small black spots, the thorax slightly humped on the back, the pupa smooth throughout." (*de Nicéville, l.c.*)

The early stages of this species are also described by Dr. Lang (*l.c.*) as follows:—

"*Larva*. Green or olive, or sometimes reddish brown, with a dark dorsal stripe. The spiracles are yellow, and below there is a white lateral stripe; above the spiracles on each segment is an oblique line, paler than the ground-colour. *Pupa*. Reddish yellow, dotted with brown, and with black spiracles.

"The larva feeds on the pods of the common pea, also on *Colutea arborescens*, and on various leguminous plants, devouring the seeds. The eggs are laid in the autumn on the twigs of the plants, the newly emerged larva entering the young pods in the following summer; when it is fully grown it undergoes its pupation on the stems or on the leaves."

This species, which is widely distributed throughout the greater part of the Old World, occurs sparingly in all the Chinese localities visited by my collectors; it is also found in Japan, but it is very rare in that country.

Genus ORTHOMIELLA.

Orthomiella, de Nicéville, Butt. Ind. iii. p. 125 (1890).

"**FORE WING**: costa evenly and gently curved throughout, apex rather acute, outer margin convex, inner margin rather sinuous, inner angle acute, produced; costal nervure ending opposite the apex of the discoidal cell; first subcostal nervule completely anastomosed with the costal nervure, into which it runs immediately after its origin, the costal nervure being bent downwards

to meet it, again becoming free and reaching the margin some distance beyond the apex of the cell; second subcostal with its base nearer to the base of the first subcostal than to the base of the upper discoidal; third subcostal originating midway between the apices of the cell and the wing; middle discocellular nervule slightly outwardly oblique, concave; lower discocellular of the same length as the middle discocellular, slightly inwardly oblique, concave; second median nervule originating some little distance before the lower end of the discoidal cell; submedian nervule following the inner margin, slightly bent downwards towards its extremity. Hind wing: costa arched at base, then slightly concave to apex, apex acute, outer margin at first straight, then convex; anal angle rounded; costal nervure very long, sinuous, following the outline of the wing, ending on the margin at the apex of the wing; first subcostal nervule originating some distance before the apex of the discoidal cell; discocellular nervules nearly erect, concave; second median nervule originating immediately before the lower end of the cell; submedian and internal nervures straight. *Antennae* short, less than half the length of the costa of the fore wing, with a large, flattened, spatulate club. *Palpi* long, porrect, second joint furnished with very long bristly hairs beneath, third joint naked, acicular. *Eyes* hairy. Head with a tuft of long hairs between the bases of the antennae. Male with no secondary sexual characters. Female with the outer margin of the fore wing more convex than in the male, otherwise similar.

“Type *Chilades? pontis*, Elwes.” (*de Nicéville, l. c.*)

Orthomiella pontis. (Plate XXXI. fig. 19, ♀, var.)

Chilades? pontis, Elwes, Proc. Zool. Soc. Lond. 1887, p. 446; Trans. Ent. Soc. Lond. 1888, p. 384, pl. viii, fig. 5, ♂.

Chilades? sinensis, Elwes, P. Z. S. 1887, p. 446.

Orthomiella pontis, de Nicéville, Butt. Ind. iii. p. 126, pl. xxvi. fig. 177, ♂ (1890).

“Male above dull purplish black, with faint green or (in some lights) purple reflection, darker towards the body. Fringes alternated with black and white.

“Beneath dull grey, with irregular darker markings, which on the hind wing coalesce into a blackish patch powdered with grey on the inner half of the wing.

“Body black, with grey hairs and palpi. Antennae faintly ringed, with a short distinct club.

“Expanse $\frac{1}{10}$ inch.” (*Elwes, l. c.*)

Var. *sinensis*, Elwes. (Plate XXXI. fig. 19, ♀.) “Resembles *C. pontis*, but has a broad border of a darker colour than the wings, no green reflections, and a much rounder apex to the fore wing. Beneath, the markings are very similar but more continuous, and there is an outer band near the margin of the fore wing not found in *C. pontis*. The dark markings on the hind wing also come nearer to the margin.”

The type of *O. pontis* was described by Mr. Elwes from specimens taken by himself “on the bridge crossing the Rangpi River on the way from Darjiling to Mongpo, at about 6000 feet elevation, in dense dripping evergreen forest.” The description of var. *sinensis* appears to have been made from a specimen taken by me near Ningpo in April 1886, and also

applies to specimens from Kiukiang which were taken by Mariés and are in the National Collection at South Kensington.

The only specimens that I have are an example of each sex taken by my collectors at Chang-yang. The upper surface of the male exactly corresponds with *pontis* from Sikkim, and the female seems to agree with the description of *sinensis*, the type of which was probably a female also.

In Möller's collection there is a good series of *pontis*, which includes one female example, taken in Sikkim. The female has the wings broadly bordered with black, and the disc is bright bluish purple, with a greenish reflection at the base. I can see no greenish reflection in any of the males from Sikkim, which are all of a bright purple in one light, and brown in another. The markings on the under surface are also somewhat variable. I cannot, however, find any character by which *sinensis* can be specifically separated from *pontis*, and can therefore only regard the former as a local race of the latter.

Genus NIPHANDA.

Niphanda, Moore, Proc. Zool. Soc. Lond. 1874, p. 572.

"Palpi very long, porrect, extending much beyond the head, flattened; second joint fusiform, squamose; third joint slender, naked, slightly thickened vertically at the tip. Antennæ (broken). Body robust. Legs slender, minutely squamose. Wings broad, strong: fore wing elongated, trigonal, costa arched; hind margin extending much beyond posterior wing; exterior margin slightly convex towards posterior angle, which is acute; median vein with four branches, the second and fourth arising at the extremity of the cell, the third starting from the second near its extremity before the apex: hind wing arched along anterior margin; outer angle much rounded, abdominal margin long and nearly straight, anal angle acute. Near to *Chrysophanus*." (Moore, l. c.)

Niphanda fusca. (Plate XXXI. fig. 17, ♀ var.)

♀. *Thecla fusca*, Bremer & Grey, Schmett. N. China's, p. 9 (1853); Ménétriés, Cat. Mus. Petr. i. pl. iv. fig. 5 (1855).

♂. *Amblypodia fusca*, Bremer, Bull. Acad. Petr. iii. p. 469 (1861).

Amblypodia dispar, Bremer, Lep. Ost-Sib. p. 24, pl. iii. fig. 4, ♂ (1864).

Polyommatus fuscus, Oberthür, Etud. d'Entom. ii. p. 20, pl. iv. fig. 5 (1876).

Niphanda fusca, Pryer, Rhop. Nihon. p. 13, pl. iv. fig. 2, ♀ (1886).

Thecla fusca, var. *lasurea*, Graeser, Berl. ent. Zeit. 1888, p. 74.

"Alæ anticæ maris supra cœrulescenti-violaceo-micantes, subtus fusco-grisæ; maculis, fasciis inuulsiq̄ marginalibus fuscis, albedo-annulatis. 32 m." (Bremer, Lep. Ost-Sib.)

"Alis supra: fuscis, anticis nigro-maculatis; posticis maculis duobus nigris ad angulum ani;—

subtus fusco-griseis, maculis fuscisque fuscis, albido-marginatis, lunulis marginalibus fuscis, albido-annulatis.

“Expans. alar. antic. unc. $1\frac{5}{8}$.” (*Bremer & Grey, Schmeltz, N. China's.*)

Pryer states that this species frequents highlands and mountain slopes from June to September, and gives Nikko and Fujisan as localities. I found it common throughout Japan and Corea during July and August. Pratt and Kricheldorf obtained the species at Kiukiang and Ichang in Central China, and at many of the places where they collected in Western China. Mr. W. B. Pryer records specimens from Ningpo.

The form *N. fusca*, female, to which Graeser (*l. c.*) has given the name *lasurea*, has the disc of the wings tinged with pale blue. It occurs, with all the intergrades connecting it with the type, in Central China, and a specimen from Chang-yang is figured on Plate XXXI. fig. 17.

Distribution. Amurland, Corea, Japan, Central, North, and Western China.

Genus AMBLOPALA, gen. nov.

Primaries: inner margin quite straight; outer margin very slightly convex below the pointed apex and straight from the middle to inner margin. Secondaries have the costa convex at the base, then slightly concave to the obtuse apex; the outer margin is rounded, but slightly concave below apex and towards the greatly produced anal lobe. Neuration very similar to that of *Amblypodia*.

The legs and underside of the entire body are thickly pubescent.

Antennae quite half the length of fore wing, with a well-formed club, and altogether more robust than in either *Amblypodia* or *Arhopala*.

Amblopala avidiena.

Amblypodia avidiena, Hewitson, Ent. Mo. Mag. xiv. p. 108 (1877); Hewitson, Ill.

Diurn. Lep. (*Lycenide*) Suppl. p. 23, pl. viii. figs. 72, 73 (1878).

“Upside: anterior wing with the basal half (except the costal margin, which is rufous brown) lilac-blue, the outer half dark brown, marked by a bitid spot of orange, the fringe rufous.

Posterior wing rufous brown, with a trifold subbasal blue spot; the anal lobe large and prominent. Underside: anterior wing pale ochreous brown, the outer margin broadly rufous, bordered inwardly by a line of white. Posterior wing rufous, crossed from the costal margin (where it is broad, and marked by a triangular rufous spot) to the anal angle (where it is narrow) by a band of grey bordered on both sides with white.

“Expanse $1\frac{1}{2}$ inch.

“A remarkable species, belonging to the *Narada* group.” (*Hewitson, E. M. M.*)

Except that the female is rather larger and has a little more blue on all the wings, the sexes do not differ. Hewitson's figure seems to represent a female specimen.

Appears to be a very scarce species. I have one male specimen taken by a native collector at Chang-yang at an elevation of 6000 feet, and a female example from Kiu-kiang, where it was captured in May. There are specimens in the National Collection taken by Mariés, and Mr. W. B. Pryer records the species from the Suowy Valley, Ningpo.

Genus ARHOPALA.

Arhopala, Boisduval, Voy. Astr., Lép. p. 75 (1832); de Nicéville, Butt. Ind. iii. p. 226 (1890).

Narathura, Moore, Proc. Zool. Soc. Lond. 1878, p. 835; Distant, Rhop. Malay. p. 259 (1885).

Amblypodia, auctorum (*nec* Horsfield).

“ WINGS broad.

“ *Fore wing*: costa nearly straight, moderately arched or strongly arched, often distinctly waved towards the apex between the terminations of the nervules; apex acute, the acuteness varying in intensity; outer margin sometimes straight, sometimes regularly convex, sometimes strongly convex, sometimes slightly concave below the apex, then strongly convex; inner margin slightly emarginate in the middle; costal nervure short, but varying slightly in length, never reaching to opposite the apex of the discoidal cell; first and second subcostal and upper discoidal nervules with their bases about equidistant; third subcostal nervule rather short, arising nearer to the apex of the wing than to the apex of the cell, varying in length; middle discocellular nervule given off some little distance beyond the origin of the upper discoidal, very short, straight, outwardly oblique (in some species the middle discocellular appears almost to form the base of the lower discoidal nervule, being nearly as thick as that vein; in other species the middle discocellular is but little thicker than the lower, in others again both are equally thin); lower discocellular nervule four times as long as the middle discocellular, straight, slightly inwardly oblique; second median nervule given off some little distance before the lower end of the cell; first median nervule curved, bowed downwards soon after its origin, the median nervule angled upwards beyond the point where the first median nervule is given off; submedian nervure straight.

“ *Rind wing* sometimes entire, sometimes waved, sometimes furnished with a short tail at the termination of the first median nervule, sometimes this tail considerably longer, sometimes there is an additional very short tooth or tail at the termination of the second median nervule, sometimes still a third tail, but very short, at the termination of the submedian nervure; anal angle sometimes rounded, sometimes acute, sometimes distinctly lobed; abdominal margin sometimes straight, sometimes convex to the termination of the internal nervure, then slightly emarginate; costa sometimes regularly arched, sometimes bowed at base, then quite straight, sometimes the outer margin is anteriorly produced at the apex, thus causing the costa to be sinuate; costal nervure sometimes nearly straight, sometimes considerably bowed, sometimes lying quite close to the margin, sometimes well removed from it; first subcostal nervule arched, given off some little distance before the apex of the cell; upper discocellular nervule shorter than the lower, slightly concave, slightly

outwardly oblique; lower discocellular sometimes upright, sometimes slightly inwardly oblique, straight or slightly concave; second median nervule emitted always a little before the lower end of the cell; submedian nervure a little waved; internal nervure short, recurved.

"*Antennae* short, less than half the length of the costa of the fore wing, with a gradually formed attenuated club.

"*Palpi* moderately long, porrect.

"*Eyes* smooth.

"*Body* moderately robust.

"*LARVA* onisciform, posteriorly flattened, bristly at the sides. *Pupa* of the usual lycænid-shape."
(*de Nicéville, l. c.*)

Arhopala ganesa. (Plate XXX. fig. 11, var.)

Amblypodia ganesa, Moore, Cat. Lep. Mus. E. I. C. p. 44, pl. i a. fig. 9 (1857).

Amblypodia ganesa, var. *seminigra*, Leech, Entomologist, xxiii. p. 44 (1890).

Amblypodia loomisi, Pryer, Rhop. Nihon. p. 11, pl. ii. fig. 15 (1886).

Arhopala ganesa, de Nicéville, Butt. Ind. iii. p. 273 (1890).

"*Upperside*: fore wing with discoidal cell and posterior base sky-blue; the end of discoidal cell and between discoidal veinlets white; rest of wing dark brown; hind wing sky-blue to near exterior margin, rest brown; abdominal margin and cilia paler. *Underside* cream-white; fore wings nearly covered with broad undulating brown bands; hind wings with ill-defined undulating bands; near outer margin of both wings appears a very faint undulated line and a series of dots. Wings shaped as in *A. querceti* and *A. dodonæa*. Without tails.

"*Expanse* of wings $1\frac{1}{4}$ inch." (*Moore, l. c.*)

Var. **loomisii**, Pryer (= *seminigra*, Leech). (Plate XXX. fig. 11, ♂.) *Male*. Primaries blue, paler beyond cell; costa and outer margin deeply bordered with black; the discoidal spot, which is within the costal border, is more intensely black. Secondaries black, suffused with blue, most pronounced along the central area. Fringes fuscous grey. Under surface pale brownish grey, with four whitish wavy-edged darker bands—the first two are basal, the third is abbreviated, the fourth broad and the only one which is clearly defined; submarginal line slender and interrupted; secondaries greyish brown, with four interrupted bands, these are of the ground-colour, but darker at the edges and bordered with whitish; brownish submarginal line wavy, bordered with whitish and followed by a few brownish linear dots on the margin; fringes pale grey, preceded by a darker line.

Expanse 32 millim.

At the time I described the above form of *A. ganesa* I was not acquainted with Pryer's *loomisi*; but I now find that the latter and my var. *seminigra* are identical; as, however, Pryer's name is the earlier one, it must stand for the Japanese and Chinese form of the Indian *A. ganesa*.

The type of *loomisi* was taken at Kanozan in Kadzusa, Japan, and I received one example from Chang-yang, Central China, and another from Chow-pin-sa, Western China.

In India *ganesa* appears to be restricted to the Western Himalayas. I have a nice series of the typical form taken by Capt. Young at Sultanpore, Kulu.

Col. Lang, according to de Nicéville, states that *A. ganesa* occurs in oak-forests at elevations varying from 5500 to 6500 feet. The sinuous character of the costa of secondaries is suggestive of the genus *Mahathala*.

Arhopala japonica. (Plate XXX. fig. 14, ♂.)

Amblypodia japonica, Murray, Ent. Mo. Mag. xi. p. 170 (1875); Pryer, Rhop. Nihon. p. 11, pl. ii. fig. 14 (1886).

“Alis suprà violaceo-ceruleis, late nigro-marginatis, anticis ad apicem subfalcatis, posticis ecaudatis: alis omnibus subtus brunneis strigis fasciisque saturatoribus.

“Alar. exp. 1" 6". Habitat Japoniam.

“All the wings are above of a rich dark blue, widely black-bordered, with only a trace of discocellular streaks. Underside brown, whitish along inner margin of fore wing. Fore wing: an oblong mark closing cell, a spot within cell, a spot below each of these, a transverse submaular fascia beyond middle, bent on first median nervure, a series of lunules along the hind margin, and a line before the fringe darker brown. Hind wing: markings very indistinct: a basal row of three minute blackish dots, followed by a transverse band of hardly perceptible brown spots; a rather large outlined discocellular mark; a transverse maular band, the spots composing which (except the two nearest the costa) are only outlined with darker; and a submarginal row of crescents, edged interiorly near anal angle by greyish-blue scales. Fringe shining brown. All the dark markings of the underside are faintly and very narrowly edged with lighter brown.” (Murray, *l. c.*)

A common insect in Southern Japan in May. I captured specimens also in the autumn in Central Japan and at Gensan, Corea, in July. Pryer (*l. c.*) states that this species hibernates.

Arhopala rama.

Thecla rama, Kollar, Flügel's Kaschmir, iv. pt. 2, p. 412, pl. iv. figs. 1, 2, ♂ (1848).

Amblypodia rama, Hewitson, Cat. (*Lycœnidae*) Brit. Mus. p. 13, pl. vii. figs. 69, 70, ♂, 71, ♀ (1862).

Panchala rama, Moore, Proc. Zool. Soc. Lond. 1882, p. 252.

Arhopala rama, de Nicéville, Butt. Ind. iii. p. 251 (1890).

Amblypodia querceti, Moore, Horsfield & Moore, Cat. Lep. Mus. E. I. C. i. p. 43 (1857).

“Alis fuscis cyaneo nitentibus, posticis unicaudatis, subtus omnibus dilute fuscis, fasciis obsoletis undulatis obscurioribus.—Expans. alar. 1" 4".” (Kollar, *l. c.*)

A. querceti, Moore.—“*Male*. Upperside purple; fore wing with broadish brown exterior margin commencing from middle of anterior margin; hind wing with broad brown margins.

“*Female*. Upperside, with discoidal cell and posterior base of fore wing and middle of hind wing purple, the disc of fore wing being somewhat lighter and pinky; the rest of the wings

brown. Underside greyish brown, slightly rufescent on fore wing; an undulating broad band of rufescent brown crosses the fore and hind wings, another inwardly on the latter half across the wing, then two or three spots; near exterior margin of both wings is an indistinct angulated line; fore wing angulated exteriorly; hind wing rounded; tail, one.

“Expanse of wings $1\frac{1}{2}$ inch.” (*Moore, Cat. Lep. E. I. C.*)

Appears to be common at Kiukiang in Central China.

According to Mr. de Nicéville, *A. rama* is one of the most widely distributed and abundant species of the genus. It occurs in oak-woods in the outer ranges of the Western Himalayas up to an elevation of about 9000 feet. In Sikkim it is much rarer, and has been taken in June and July.

Arhopala turbata.

Abllypodia turbata, Butler, Proc. Zool. Soc. Lond. 1881, p. 855; Pryer, Rhop. Nihou. p. 11, pl. ii. fig. 16 (1886).

Satadra teesta, de Nicéville, Journ. Asiat. Soc. Beng. lv. pt. 2, p. 253, pl. xi. fig. 3, ♂ (1886).

Arhopala teesta, de Nicéville, Butt. Ind. iii. p. 250, pl. xxvii. fig. 197, ♂ (1890).

“*Male*. Form and size of *A. diardi*; but the secondaries comparatively rather larger, the wings above dull blue instead of violet, and with a rather broad black external border; under surface more like *A. apilanus* in pattern and coloration, but the costal thirds of all the wings washed with lilac, across which the olive-brown bands ran; the abdominal half of secondaries crossed by three irregularly arched nebulous blackish bands, increasing in intensity and in extent as they approach the outer margin; the basal area also ashy instead of dark brown, and the markings on the basal half of the primaries small and more feebly indicated than those of the external half. Expanse of wings 1 inch 11 lines.

“*Female*. Primaries above bright ultramarine, with a very broad black apical area and external border; secondaries and body blackish brown; wings below more like *A. centaureus* than the male, the arched abdominal bands obsolete, replaced by a continuation of the ordinary pale-edged macular bands. Expanse of wings 1 inch 11 lines.” (*Butler, l. c.*)

In Japan this species has been recorded from Nagasaki and Nikko. I took specimens in the Province of Satsuma in May, flying in company with *A. japonica*, and I have received examples taken at Gensan, Corea, by native collectors. It appears to be always rare.

There is a fine series of *A. teesta*, which is certainly synonymous with *A. turbata*, in Möller's collection, from Darjiling.

Distribution. Japan, Corea, Sikkim, Sylhet, and Tenasserim.

Genus ZINASPA.

Zinaspæ, de Nicéville, Butt. Ind. iii. p. 451 (1890).

“Allied to *Rapala*, Moore, from which it differs in both sexes in the antennæ being shorter, the

palpi nearly twice as long and stouter (much longer in the female than in the male), and the male lacking the tuft of hair on the inner margin of the fore wing, and the glandular patch below the costa of the hind wing present in that genus. The eyes are naked," (*de Nicéville, l. c.*)

Zinaspa distorta.

Rapala distorta, de Nicéville, Proc. Zool. Soc. Lond. 1887, p. 461, pl. xl, fig. 6, ♀.

Zinaspa distorta, de Nicéville, Butt. Ind. iii. p. 452, pl. xxix. fig. 239, ♂ (1890).

"*Male*. Upperside: both wings black. Fore wing with the basal and lower discal areas very deep shining purple, the costal margin broadly, the outer margin still more broadly and the apex broadest of all, of the ground-colour, the purple coloration occupying about two thirds of the surface of the wing. Hind wing with the basal and lower discal areas very deep shining purple, the costa and apex extremely broadly, the outer margin narrowly, black, the abdominal margin pale fuscous. Underside: both wings as in the female, but of a deeper vinous colour: all the markings less prominent.

"*Female*. Upperside: both wings almost black, somewhat paler on the hind wing. Fore wing with all but the costa widely, the apex and outer margin still more widely (which are of the ground-colour), rich bluish purple. Hind wing with a lengthened discal patch of bluish purple, which occupies the lower half of the discoidal cell, and extends beyond it into the discoidal and median interspaces, but does not nearly reach the outer margin (this patch is sometimes entirely wanting). Tail dull ferruginous, tipped with white. Underside: both wings dull ferruginous or cinnamon-coloured, glossed with vinous. Fore wing with a narrow white discal line formed of short lunules between the veins, that portion below the first median nervule shifted inwards: a double submarginal series of short white lines, more diffused than the discal line, placed between the veins, which gives the appearance of six increasing spots of the ground-colour defined with white. Hind wing with a discal white line as in the fore wing, but much more distorted and irregular: an obscure similar basal line, and a submarginal very dentate one; the area beyond the latter irrorated with whitish, including an obscure rounded ferruginous-spot in the first median interspace (sometimes centred with black); a fine white anteciliary line obsolete anteriorly. Cilia brownish ferruginous throughout.

"Allied to *Rapala* (*Sarcodra*) *amisena*, Hewitson, who describes and figures the female, while Mr. Distant figures the opposite sex, both from Singapore. Differs from the same (female) sex of that species, judging from the figure and description only, in having the purple area of the upperside of the fore wing of less extent and sharply defined (in *R. amisena* it appears to be suffused over nearly the whole wing, with no sharp edges), and on the underside of both wings in the markings being fewer and white throughout, instead of dark fuscous: with no trace of the dull light blue irroration at the anal angle of the hind wing, with a lunular black spot between the tails, described by Hewitson as occurring in his '*Amblypodia*' *amisena*." (*de Nicéville, l. c.*)

My collectors found this species rather common at Ni-tou and Huang-muchang in Western China, during July and August. The specimens differ from the Sikkim type in Möller's collection in being smaller and in having

the purple of the upper surface darker in tone, whilst the under surface is grey instead of ferruginous.

Distribution. Sikkim, Assam, Burma, Western China.

Genus MAHATHALA.

Mahathala, Moore, Proc. Zool. Soc. Lond. 1878, p. 702.

- “Wings broad: fore wing somewhat short, outer margin nearly erect and slightly scalloped; third subcostal branch bifurcate: hind wing short; costa abbreviated, lobed at the base, concave towards the end, the apex produced and pointed upward; exterior margin slightly concave below the apex, and very convex in the middle; anal angle lobed; a spatulate tail extending from end of lower median vein; palpi long, stout, apical joint broad laterally; antennæ thickened to apex.
- “Differs from typical *Amblypodia* (*A. narada*, Horsfield) in the entirely different form of wings; the fore wing having the third branch of the subcostal vein bifurcate instead of trifurcate, as in the male of *A. narada*.” (*Moore, l. c.*)

Mahathala ameria.

Amblypodia ameria, Hewitson, Cat. Lyc. Brit. Mus. p. 14, pl. viii. figs. 85, 86, ♀ (1862).

Mahathala ameria, Moore, Proc. Zool. Soc. Lond. 1878, p. 703; de Nicéville, Butt. Ind. iii. p. 283, pl. xxvii. fig. 200 (1890).

Amblypodia angulata, Leech, Entomologist, xxiii. p. 44 (1890).

Narathura ameria, Distant, Rhop. Malay. p. 268, pl. xxi. fig. 30, ♀ (1885).

- “Upperside brown. Anterior wing dark brown, with a large spot of lilac-blue from the base to the middle. Posterior wing rufous-brown, with a small narrow spot of blue near the base; the tail broader than usual.
- “Underside. Anterior wing rufous-brown, the apex grey; three small white spots within the cell; two spots at the end of the cell margined with white; the transverse band broad, of nearly equal width, curved near the apex. Posterior wing rufous- or grey-brown; the costal margin near the apex protruded outwards to an acute point; the base and an ill-defined central band rufous brown.” (*Hewitson, l. c.*)
- “*Male*. Upperside: both wings of a rich deep blue, not purple as in the female, the outer margins narrowly black. Underside: both wings as in the female.” (*de Nicéville, l. c.*)

Amblypodia angulata, Leech.—*Female*. Costa of primaries slightly sinuous, outer margin dentate and rather concave from apex to middle. Costa of secondaries convex near the base, then concave to the acuminate and vertical apex, from whence the outer margin descends obliquely to the middle, when it becomes rounded; tails are somewhat spatulate. Black, with a strong suffusion of bluish purple, intersected by the black venation, on the disc of all the wings; discoidal spot of secondaries black and bar-like. Under surface of primaries blackish, with a large quadrate pale grey blotch on the greyish inner margin, preceded by some short brownish-grey transverse lines on the disc; central line brownish grey, curved and wavy; submarginal line darker, edged internally with black, twice angulated above inner margin, and followed by some indistinct dark grey-brown lunules; secondaries grey, irrorated with black, suffused

with violet towards the base, and clouded with obscure purplish violet over the rest of the wing; several pale but ill-defined transverse lines.

Expanse 40 millim.

Occurs at Moupin, Western China, in June, and also at Chang-yang in Central China; but it is apparently a scarce species, as my collectors only obtained one specimen of each sex.

Mr. de Nicéville (*l. c.*) says:—" *M. ameria* is very variable in the extent of the purple coloration of the female on the upperside. Calcutta specimens have about one third less purple than those from the Malay Peninsula, the purple not reaching the costa of the fore wing. The female appears to be far more often met with than the male, of which sex I have seen two specimens only. *M. ameria* is a rare species, with a wide range, occurring in the plains of Bengal, in Assam, in the Chittagong Hill Tracts, Mergui, Perak, and Hainan."

Genus CURETIS.

Curetis, Hübn. Verz. bek. Schmett. p. 102 (1816); Moore, Lep. Ceyl. i. p. 73 (1881);

Distant, Rhop. Malay. p. 201 (1884); de Nicéville, Butt. Ind. iii. p. 284 (1890).

Phædra, Horsfield, Cat. Lep. E. I. C. p. 123 (1829).

Anops, Boisd. Spéc. Gén. i. pl. xxiii. fig. I (1836); Westwood, Gen. Diurn. Lep. p. 473 (1852).

" *Anterior* wings subtriangular; costal margin strongly arched at base, and then almost obliquely straight to apex, which is either subacute or prominently and falcately acute; outer margin concavely sinuate where the apex is produced; inner margin concavely sinuate in the male, obscurely so in the female; first subcostal nervule emitted at about one third before end of cell, second at one fourth before end of cell, third and fourth bifurcating about midway between end of cell and apex of wing.

" *Posterior* wings rounded, the anal angle more acute in the male than in the female; subcostal nervules bifurcating near end of cell.

" *Eggs* hairy.

" *Palpi* porrect, clothed with fine adpressed scales; apical joint slender, longer in the female than in the male.

" *Antennæ* short, gradually thickened into a long apical club.

" *Legs* short, thick, and densely clothed with scales; anterior tarsus of the male consisting of a single joint, with an obtuse apical claw, and with some fine spines beneath; anterior tarsus of the female five-jointed, with two small apical claws." (*Distant, l. c.*)

Curetis angulata.

Curetis angulata, Moore, Proc. Zool. Soc. Lond. 1883, p. 522, pl. xlvi. fig. 2.

" *Male*. From typical *C. balis* (Doubleclay and Hewitson, Gen. Diurn. Lep. pl. lxxv.) this differs in

the fore wing being pointed and acuminate at the apex; the red area is paler and broader, extending to the posterior margin towards the base; the dentate mark at the end of the cell is also prominent. On the hind wing the exterior margin is much produced to an angle in the middle, and the anal end more produced; the red area is also paler, and extends from the costal edge broadly over the disc, leaving only an exterior marginal blackish band and a suffused medial basal area.

"*Female*. With similar outline of wings, and broad white discal areas. Expanse $1\frac{3}{4}$ inch.

"N.W. Himalayas." (*Moore, l. c.*)

I have only one example of each sex; these were taken in the Ichang Gorge in September. The male agrees very well with Moore's figure of *angulata*.

Elwes (*Trans. Ent. Soc. Lond.* 1888, p. 372) seems to regard *angulata*, *dentata*, and *discalis*, Moore, as forms of *C. bulis*, and in this I am inclined to think that he is probably correct.

In the Möller collection there are thirty specimens of *Curetis* which have been arranged in series according to the angulation of the wings and the amount of red colour on upper surface of the males and of bluish white in the females. Mr. de Nicéville considers all these to be referable to one variable species, i. e. *C. bulis*.

Curetis acuta.

Curetis acuta, Moore, *Ann. & Mag. Nat. Hist.* (4) xx. p. 50 (1877); Pryer, *Rhop. Nihon*, p. 11, pl. iv. figs. 1, 2 (1887).

Curetis truncata, Moore, *l. c.* p. 51 (1877).

"Nearest to *C. bulis*, Btl.; differs in both sexes in the acute prolongation of the apical angle, and obliquity of the outer margin, of the fore wing; darker colour: the golden (in the male) and white (in the female) portion of both wings less prominent, being confined to a smaller space on the middle of the wing. Expanse 2 inches.

"Shanghai." (*Moore, l. c.*)

Var. *truncata*, Moore. "*Female*. Brown; fore wing indistinctly paler towards the base: hind wing whitish narrowly on anterior margin and slightly at the apex. Underside less prominently marked than in *C. acuta*. Expanse $1\frac{5}{8}$ inch.

"Shanghai." (*Moore, l. c.*)

In this species the angulation of the wing is subject to considerable variation, and I cannot find any specific difference between *C. acuta* and the insect which Mr. Moore has described as *truncata*.

Occurs in some numbers at Chia-ting-fu and Omei-shan in Western China, also at Chang-yang and Kiukiang, and is common in the mountains of Central Japan.

Genus CAMENA.

Camena, Hewitson, Ill. Diurn. Lep. p. 47 (1865); Moore, Proc. Zool. Soc. Lond. 1883, p. 529; de Nicéville, Butt. Ind. iii. p. 338 (1890).

Pratapa, Moore, Lep. Ceyl. i. p. 108 (1881).

- “HEAD large. *Eyes* smooth, the space between them prominent, thickly clothed alternately with black and white hair. *Palpi* smooth, very erect, long; the second joint compressed, rising above the head; the terminal joint of the male as long as the second. *Antenna* of moderate length, with numerous short joints indicated by white on the underside. *Body* robust.
- “ANTERIOR WING triangular; costal margin nearly straight; outer margin slightly curved outwards, shorter than the other margins; inner margin slightly projecting near the base, where it is clothed with a tuft of hair on its underside. Costal nervure extending to the middle of the margin; subcostal nervure with three branches, two before the end of the cell, the third at a distance from the apex; the discoidal cell half the length of the wing, closed by two discocellular nervules in a straight line; the second three times as long as the first, joining the third branch of the median nervure a little beyond its base; the upper discoidal nervure leaves the subcostal before the end of the cell.
- “POSTERIOR WING with two slender tails; the abdominal fold and anal angle clothed thickly with long hair; the costal nervure continued to the apex of the wing; the subcostal branched before the end of the cell; the cell short, closed obliquely by nervules of equal length joining the third branch of the median nervule a little beyond its base.” (*Hewitson, l. c.*)

Camena icetas.

Iolus icetas, Hewitson, Ill. Diurn. Lep., *Lycenidæ*, p. 44, pl. xviii. figs. 6, 7, ♂ (1869).

Camena icetas, de Nicéville, Butt. Ind. iii. p. 342 (1890).

Iolus contractus, Leech, Entomologist, xxiii. p. 39 (1890).

- “*Male*. Brilliant ultramarine blue. Anterior wing with more than the outer half dark brown, the tuft of hair at the meeting of the wings black. Posterior wing with the costal and outer margins brown. Underside grey, paler towards the outer margins. Both wings crossed beyond the middle by a linear band of brown; the outer margin rufous. Posterior wing with the two black spots near the anal angle crowned with orange. Expanse $1\frac{4}{10}$ inch.” (*Hewitson, l. c.*)
- “*Female*. Both wings black. Fore wing with the lower basal and discal areas pale blue, rather darker towards the base of the wing. Hind wing with the disc more or less pale blue; some indistinct black submarginal spots; anal lobe bright ochreous, as in the male. Cilia whitish throughout. Underside: both wings as in the male.” (*de Nicéville, l. c.*)

I. contractus, Leech.—*Male*. Black, ornamented with bright dark blue, which on the primaries forms a patch extending from the base to the middle of the disc between the median and submedian nerves, slightly encroaching beyond each boundary. On the secondaries the blue forms a broad oblique abbreviated band, its anterior limit being the second subcostal nervule, and its posterior the first median, but there is a small triangular mark beyond this latter boundary, extending to the orange spot at anal angle; there are some black spots towards the outer edge of the blue band; the abdominal margin is paler, becoming whitish at the base. There are two tails of equal length, both black with white tips. Under surface of

primaries whitish grey; discoidal spot linear, white; central transverse line blackish, terminating at the submedian nervure; submarginal line indistinct; on the middle of inner margin is a fan-like arrangement of long dark grey hairs; central transverse line of secondaries wavy, turning off at a right angle to abdominal margin when opposite anal angle; outer margin bordered with dark grey, intersected by a band of ground-colour; a large black spot on the outer edge of a round orange patch before the first tail, and one at angle preceded by an orange streak.

Female. Greyish black, with a patch of pale lilac-blue on the disc of primaries, and some scales of the same colour towards outer margin of secondaries; fringes grey. On the under surface the lines are more distinct and the spots larger. In one female specimen the lilac-blue is only shown on the primaries as a discal suffusion.

Expanse, ♂ 38 millim., ♀ 40-42 millim.

One female example from Omei-shan is without blue on upper surface of primaries, and there are no transverse wavy lines on the under surface.

This insect appears to be widely distributed throughout the Himalayas, but nowhere common; de Nicéville records it from Chumba, Kulu, Simla (6000 feet), Masuri, Naini-tal, and Darjiling. It is on the wing in May and August.

Occurs in Western China at Omei-shan in June, and Chia-ting-fu in July, and at Chang-yang, Central China, in July and August.

Since describing this species under the name of *contractus*, I have received a large number of specimens, and now find that, although variable, my insect cannot be specifically separated from *C. ictas*, Hewitson.

Camena ctesia.

Camena ctesia, Hewitson, Ill. Diurn. Lep. p. 48, pl. xx. figs. 1, 2, ♂ (1865); Elwes, Trans. Ent. Soc. Lond. 1888, p. 394, pl. viii. fig. 6; de Nicéville, Butt. Ind. iii. p. 340, pl. xxviii. fig. 215, ♂ (1890).

"Upperside. *Male*. Brilliant ultramarine blue, marked by a triangular dark brown spot; all the margins broadly dark brown. Posterior wing with the apex dark brown; an apical brown spot irrorated with white.

"Underside. Glossy grey. Both wings with a brown spot at the end of the cell, each crossed beyond the middle by a band of dark brown spots bordered with white, each with a band of brown (scarcely visible on the anterior wing) near the outer margin. Posterior wing with a submarginal band of brown spots, the two apical spots crowned with orange. Expanse $1\frac{6}{10}$ inch." (*Hewitson, l. c.*)

"*Female*. Upperside: fore wing differs from the male in the absence of the two black spots, otherwise as in the male." (*de Nicéville, l. c.*)

I have one male specimen from Chia-kou-ho, Western China, taken in July at a low elevation. This example differs from Indian specimens in having less blue on upper surface and a larger discal spot on primaries; the under surface is browner.

According to Mr. de Nicéville the males are very common in Sikkim in June and October. Mr. Elwes (*l. c.*) figures a female specimen which he took in August at Rikisum, 6000 feet elevation, in British Bhotan. He also records the species from the Jaintia Hills.

Genus SATSUMA.

Satsuma, Murray, Entom. Month. Mag. xi. p. 168 (1875).

"Oculi sat magni pilosi. Palpi valde pilosi, porrecti. Antennæ graciles, sat longæ, distinctissime albo-annulate, in clavam distinctam subito desinentes. Alæ angulate, antice venâ subcostali triramosâ, postice ad angulum analem valde productæ.

"Head of moderate size; eyes hairy; palpi moderately long, porrect, densely clothed with long hairs, terminal joint slender; antennæ rather long, slender, white-ringed, with distinct fusiform club.

"Thorax robust. Wings triangular, elbowed on hind margin, especially the hind wing, which possesses a distinct lobe at anal angle.

"Male with a small, almost linear, patch on fore wing at extremity of cell, similar to that observed in many species of *Thecla*.

"Hind wing with a distinct groove to receive abdomen. Fringes spotted." (*Murray, l. c.*)

This genus was founded by the Rev. R. P. Murray for the reception of the species described by Mr. Butler as "*Lycana*" *ferrea*, which has been considered identical with the "*Thecla*" *frivaldszkji* of Lederer and the "*Thecla*" *carulescens* of Motschulsky. This determination is, however, partly erroneous, as *frivaldszkji* is certainly specifically distinct from *ferrea*; but it is not possible to judge from the description whether Motschulsky's *carulescens* is referable to either of these; as, however, the specimen was said to be from Japan it is probably *S. ferrea*.

In 1890 I added two new species to the genus, i. e. *S. chalybeia* and *S. pratti*, both from Central China. A fifth species was indicated by Mr. de Nicéville in the 'Bombay Natural History Journal,' 1891, and this may turn out to be the same as *S. nicévillei* from Central China described by me in the present work, but as Mr. de Nicéville has not named his insect, synonymy will not be involved. *S. circe*, from Western China, also described in these pages, increases the number of known species of the genus *Satsuma* to seven.

The species of *Satsuma* may be grouped as follows:—

- | | | | |
|----|------------------------------------|-----------|---|
| a. | Male mark small and pale in colour | | <i>S. chalybeia</i> . |
| b. | " " large " " " | | <i>S. ferrea</i> and <i>S. circe</i> . |
| c. | " " small " dark " | | <i>S. frivaldszkji</i> and <i>S. pratti</i> . |
| d. | " " large " " " | | <i>S. nicévillei</i> . |

Thecla rubi, Linnæus, has the male mark as in *S. ferrea* and *S. circe*, and in many other respects is similar in structure to the latter.

Mr. de Nicéville is inclined to merge the genus *Satsuma* in *Thecla* because *Satsuma* agrees with *Thecla spinii* and *T. rubi* in the venuration and character of the male mark; but it appears to me that it would be better to remove *rubi* into the genus *Satsuma*, as the shape of the wings of this species, absence of tails, and character of under surface ornamentation are quite unlike any true *Thecla* (of which *T. spinii* is the type); it agrees, however, in most respects with the species included in the genus *Satsuma*.

Satsuma ferrea.

Lycæna ferrea, Butler, Journ. Linn. Soc., Zool. ix. p. 57 (1868).

Satsuma ferrea, Murray, Ent. Mo. Mag. xi. p. 168 (1874).

Thecla frivaldszkyi, Pryor (nec Lederer), Rhop. Nihon. p. 16, pl. iv. fig. 20 (1886).

? *Thecla cærulescens*, Motschulsky, Bull. Mosc. xxxix. pt. 1, p. 191 (1866)*.

Lycæna ferrea, Butl.—“Alæ supra chalybeo-cæruleæ, marginibus cinereo-fuscis.

“Alæ antice subtus cinereo-fuscæ, cella fusco terminata, fascia post cellam angulata fusca extus pallida post nervulum medianum secundum terminanti; posticæ fusco-rufescentes, area abdominali cinereo rotata, fascia pallida post cellam valde irregulari, ad costam intus albo marginata.

“Corpus fuscum.

“Alar exp. unc. $1\frac{1}{2}$.” (*Butler, l. c.*)

The male of this species has a large, pale, and conspicuous “sex-mark” on the primaries, very similar to this character in male *Thecla rubi*. The male of *Satsuma frivaldszkyi*, Led., has the sex-mark small, dark, and inconspicuous.

I was at one time inclined to follow Mr. Elwes in considering *Satsuma ferrea* synonymous with *S. frivaldszkyi*, but I now find that the Amurland specimens are quite distinct from the Japanese. Apart from the different character of the “male mark,” *S. ferrea*, Butler, is separable from *S. frivaldszkyi*, Lederer, by the colour and markings of the under surface of secondaries: thus in *S. ferrea* the ground-colour is reddish fuscous, and the submarginal line is brownish and diffused; in *S. frivaldszkyi* the ground-

* *Thecla cærulescens*, Motschulsky. “Statura *Th. coruler*, Bremer, Cat. Mus. Petr. i. tab. iv. fig. 4, sed maculis aurantiis nullis. Alis fusco-, apice brunneo-ciliatis: supra: cæruleis, versus marginem nigricantibus; subtus: anticis testaceo-cinereis, post medium linea transversa undulata angustissime albidâ; posticis nigro-piceis, versus latera posticæ testaceo-cinereis, linea transversa valde sinuata angustissima punctoq̄ue subapicali albidis.” (*Motschulsky, l. c.*)

colour is greyish brown, and the submarginal line is black, narrow, and serrated.

I took some specimens of a species of *Satsuma* at Gensan in the Corea, but unfortunately these have been destroyed, and I am therefore unable to say whether they were *S. ferrea* or *S. frivaldszkyi*, but I think that they were probably the latter.

This species is common in Yokohama in March, according to Pryer, and I met with it throughout Japan.

***Satsuma circe*, sp. nov.** (Plate XXX. fig. 12, ♂.)

Male. Blackish: basal area of primaries sometimes sparingly sprinkled with bluish scales: the anal lobe of secondaries is tinged with brownish and strongly developed. Fringes whitish, intersected by the black nervules. Sexual mark as in *S. ferrea*.

Female. Similar to the male, but there is more blue on the basal area of primaries. Under surface of both sexes pale reddish or ochreous brown: basal area and outer margin of secondaries darker, the former limited by a dark brown deeply indented line and traversed by an oblique dull purplish band, the latter preceded by a series of dark brown lunules: the primaries have a dark brown transverse line beyond the centre of the wing, but this does not quite attain the inner margin.

Expansion, ♂ 30 millim., ♀ 32 millim.

I received a long series of this species from Ta-chien-lu, Western China, where it occurs in May and June at a considerable elevation.

In the character of the "male mark" *S. circe* agrees with *S. ferrea*, but it is very different from that species in colour and in the markings of under surface.

***Satsuma pratti*.** (Plate XXX. fig. 10, ♂.)

Satsuma pratti, Leech, Entomologist, xxiii. p. 44 (1890).

Male. Fuliginous brown. Primaries have some blue scales below the median nervure, and the secondaries have a dull bluish reflection. Under surface of primaries brown, suffused with blackish towards the black basal area, an indistinct wavy dark central line bordered with white at costa: secondaries black, irrorated with white scales, and a brown cloud towards outer angle, the indented central line broadly bordered with white below costa and on inner margin: submarginal band wavy, ill defined, and intersected by a pale wavy line. The sexual mark is small, dark, and not well defined.

Female. Upper surface: discal area of all the wings steely blue, outer margin broadly blackish, as also is the costa of primaries. Under surface as in the male.

Expansion, ♂ 32 millim., ♀ 32-36 millim.

Separable from *Satsuma (Thecla) frivaldszkyi* by the darker colour of all

the wings, and by the white markings and blackish ground-colour of under surface of secondaries.

Occurs sparingly in June and July at Ichang and Chang-yang in Central China and at Chia-kou-ho in Western China.

Satsuma chalybeia. (Plate XXX. figs. 7 ♀, 8 var. ♂.)

Satsuma chalybeia, Lecch, Entomologist, xxiii. p. 43 (1890).

Male. Pale blue; costa, apical third, and outer margin of primaries black, as also are the fringes; secondaries with an interrupted black submarginal band; a broad black line before the black and grey fringes. Under surface grey dusted with black atoms, basal half of primaries blackish; discoidal spot, central and submarginal wavy lines black; transverse band of secondaries occupying the central third of wing, blackish, limited by black wavy lines; submarginal line black, undulating, followed by some obscure dusky spots. Fringes as above.

Female. Similar to the male, but the black margins are more clearly defined.
 Expanse 32-33 millim.

Differs from *Satsuma (Thecla) frivaldszkyi*, Ld., in having two distinct transverse lines on under surface of primaries, and in the absence of white markings on under surface of all the wings.

The above description of the male refers only to specimens from Chang-yang, Central China, from which place I first received this species. I now have male examples of *S. chalybeia* from several localities in Western China, and as these differ from the type I describe the form as var. *pluto* (Plate XXX. fig. 8):—All the wings blackish, the basal area tinged with blue in one specimen; there is a pale blue submarginal line towards anal angle, and the anal lobe is brownish; under surface brownish. The female is similar to the same sex from Central China.

Occurs at Chang-yang, Central China, and at Wa-ssu-kow, Pu-tsu-fong, and Chow-pin-sa, Western China. It flies in June and July.

Satsuma nicévillei, sp. nov. (Plate XXX. fig. 9, ♂.)

Male. Black, with a dark bluish sheen in certain lights; the basal area of all the wings greyish blue, this colour extending in some specimens into the outer marginal area of secondaries; the glandular patch is large, elongate, dark; the anal lobe is tinged with brownish, and the abdominal margin above it is hollowed out; there are indications of a bluish line on the outer margin. Fringe dark greyish.

Female. Greyish blue; the costa and outer margin of primaries broadly, and the outer margin of secondaries narrowly, bordered with black; anal lobe and excavation above as in the male.

Under surface of both sexes: primaries ochreous brown, broadly streaked with grey along the inner margin; a narrow black transverse line from the costa, just beyond the middle of the wing,

terminates at the first median nervule; secondaries rather redder than primaries; basal area darker, its outer limit not clearly defined; submarginal line blackish and interrupted. Expanse. ♂ 32 millim., ♀ 30 millim.

The female of this species is very similar to a female *Satsuma* from the Khasi Hills which Mr. de Nicéville has figured and described but not named*. In the Indian species, however, the anal angle is not lobed as in *S. nicévillei*, it also exhibits the following differences of colour and marking:—Upper surface: the black border of costa and outer margin of primaries is rather narrower; the black outer marginal border of secondaries is represented by a dash at anal angle; the fringes are whitish, distinctly chequered with black at the extremities of the nervules. Under surface ferruginous brown; central line of primaries edged with white, as also is the lower portion of the limiting line of the dark basal area of secondaries.

Probably it will ultimately be proved that *S. nicévillei* and the unnamed insect just referred to are specifically identical, but it seems advisable to leave them separate at present.

I have two males and one female taken by a native collector at Chang-yang, Central China, at an elevation of 6000 feet.

Genus THECLA.

Thecla (part.), Fabricius, Illiger's Magazin, vi. p. 285 (1807); Westwood, Gen. Diurn. Lep. ii. p. 481 (1852); de Nicéville, Butt. Ind. iii. p. 297 (1890).

“*Fore wing* subtriangular; costa arched at the base, then nearly straight to the apex; apex rather acute, slightly more rounded in the female than in the male; outer margin slightly convex or straight; inner margin straight; costal nervure ending exactly opposite the termination of the discoidal cell; first subcostal nervule given off from the subcostal nervure rather beyond the middle of the cell, second subcostal originating at about one third from the apex of the cell in the male, at about one fifth in the female; subcostal nervure reaching the apex of the wing; upper discocellular nervule absent in both sexes, middle discocellular straight, arising in the male from the upper discoidal nervule some distance beyond its origin, arising in the female exactly at its point of origin, lower discocellular of the same length as the upper, straight; second median nervule originating some little distance before the lower end of the cell; submedian nervure nearly straight. *Male* furnished with an elongated narrow shining black patch of differently formed scales from those on the rest of the wing at the anterior end of the discoidal cell, which patch is bounded anteriorly by the basal portion of the second subcostal nervule, and extends slightly into the cell and beyond its end.

“*Hind wing* ovate, all the margins rounded, furnished with a somewhat long narrow tail at the

* ‘Bombay Natural History Journal,’ vi. pp. 374-376, pl. F. fig. 17 (1891).

termination of the first median nervule, and a small anal lobe; costal nervure much arched at base; first subcostal nervule originating some distance before the apex of the cell; discocellular nervules concave, discoidal nervule from their point of junction; second median nervule originating just before the end of the cell; internal nervure very sinuous.

"*Antennae* short, not half the length of the costa of the fore wing, with a gradually formed elongated club.

"*Palpi* somewhat short, obliquely porrected, second joint bristly beneath, third joint naked.

"*Eyes* hairy.

"*Legs* short, scaly." (*de Nicéville, l. c.*)

Thecla spini.

Papilio spini, Wien. Verz. p. 186 (1776); Hübner, Eur. Schmett. i. figs. 376, 377.

Thecla spini, Lang, Butt. Eur. p. 76, pl. xvii. fig. 2 (1884).

Thecla spini, var. *latior*, Fixsen, Rom. sur Lép. iii. p. 271 (1887).

"Expands 1.18 to 1.40 inch. The wings are brown on the upper surface. The hind wings distinctly tailed. The male has one or two small orange spots near the anal angle of the hind wings. The female is larger and lighter in colour than the male, and has a large indistinct lighter patch on the fore wings, and a row of orange spots on the hind margin of the hind wings extending from the anal angle. The underside is brownish grey; the fore wings have a distinct white line beginning on the costa at a point which is distant from the hind margin by a space equal to a fourth of the width of the wing. The hind wings have a white line running from about the middle of the costa to the inner margin, taking near the anal angle an upward and then downward direction, so as to give it somewhat of a **W**-shape. Along the hind margin is a row of orange spots, and near the anal angle, and filling up the whole distance between that point and the tail, is a patch of light blue.

"*Larva* light green, with two yellowish streaks on the sides; on each segment is a row of oblique lines of a darker green than the ground-colour; on the dorsal surface, which has a dark streak, are some pink dots. Feeds in June on *Prunus spinosa* and *Crataegus oxyacantha*." (*Lang, l. c.*)

Var. *latior*, Fixsen. "One third larger than European *T. spini*. The ground-colour of the upper surface is darker and more velvety, the markings on the primaries of the female more distinct and broader; the marginal band of the secondaries sharper. On the under surface the colour is also darker than in the type; the white band on the primaries is more curved towards the inner margin, and the band on the secondaries has the **W** towards anal angle less clearly defined; the blue on the outer margin in cell 2 is darker, and this colour extends upwards between two rows of black spots; the rusty-brown band is broader and brighter."

Fixsen states that typical *T. spini* occurs commonly at Pung-tung, Corea, and that the two specimens which he describes as var. *latior* are also from that locality.

Staudinger (Rom. sur Lép. vi. p. 147) records both forms from Amurland, and says that Hertz took var. *latior* in North China.

Graeser bred the var. *latior* from larvæ found feeding in June on *Rhamnus* near Chabarofka, in Amurland (Berl. ent. Zeit. 1888, p. 71).

Thecla mera. (Plate XXIX. fig. 14, ♀.)

Thecla mera, Janson, Cistula Eutom. ii. p. 156 (1877); Pryer, Rhop. Nihon. p. 15, pl. iv. fig. 16 (1887).

"Above dark brown, secondaries produced at the anal angle and with a short outer tail, the inner one long, its apex white; beneath pale brown, both wings crossed beyond the middle by a fine wavy white line, margined with dusky brown on its inner side, divided by the nervures, bent inwards posteriorly, and ending at the abdominal margin; anal region of secondaries pale orange, with a large black spot between the tails and a row of four smaller ones just above it; anal angle black, speckled with pale blue, a fine white marginal line, and a row of obscure dusky-brown submarginal spots near the apex. Expanse of wings $1\frac{1}{2}$ inch.

"Several specimens taken by Mr. Jonas at Matzabaro, about 200 miles N.W. of Yedo [Tokio]." (*Janson, l. c.*)

The type in the National Collection appears to be a female. The male only differs in being blacker and in having a very conspicuous broad short glandular patch on the primaries.

I have a series from Oiwake and Yesso. Pryer records the species from Nikko and Assama-Yama, and states that it is a scarce insect.

Thecla w-album.

Papilio w-album, Knoch, Beitr. Ins. ii. p. 85, pl. vi. figs. 1, 2 (1782).

Thecla w-album, Lang, Butt. Eur. p. 77, pl. xvii. fig. 3 (1884); Pryer, Rhop. Nihon. p. 15, pl. iv. fig. 14 (1886).

Strymon fentoni, Butler, Proc. Zool. Soc. Lond. 1881, p. 854; Waterhouse, Aid Identif. Ins. ii. pl. exv. fig. 2.

"Expands 0.93 to 1.25 inch. Hind margin of hind wings scalloped, and with a small slender tail. Wings dark blackish brown, the nervures showing a little darker. Fore wings quite without any pattern. The hind wings have an orange spot at the anal angle; the tail is tipped with white. Underside:—The colour of all the wings is greyish brown; the fore wings have a narrow white line, somewhat wavy, reaching from the costa to the inner margin, and placed closer to the hind margin than to the base of the wing. The hind wings have a white **W**-shaped line beginning at the costa and ending at the inner margin; along the hind margin is a row of brilliant orange crescents, which are largest near the anal angle and decrease in size as they approach the costa.

"*Larva* onisciform, light green, with a yellowish-brown dorsal stripe; every segment has two oblique light yellow lines on each side; the head is black and retractile. It feeds on the leaves of the common elm (*Ulmus campestris*), from whence it may be beaten at the end of May and the beginning of June. Pupa attached to a twig by a belt of silk and also by the tail." (*Lang, l. c.*)

Strymon fentoni, Butler.—“ Nearly allied to *S. w-album* of Europe, but quite as large as *S. spini*; under surface like the latter species in tint, but with almost the pattern of *S. w-album*: the discal line of the primaries, however, is more arched and continuous, that of the secondaries is more transverse, and therefore does not run inwards in the direction of the base; the submarginal spots are more dome-shaped, of a bright orange instead of red colour; and there is a distinct submarginal white line. Expanse of wings 1 inch 5 lines.

“ Shiribetsu, Hokkaido [Yesso], August. Coll. M. Fenton.” (*Butler, l. c.*)

I am indebted to Mr. Janson for the loan of one of M. Fenton's original specimens of Butler's *fentoni*. It is rather larger than the examples of *T. w-album* from Yesso in Pryer's collection, but not so large as some of my European specimens. I cannot find any character by which *fentoni*, Butler, may be separated, even as a local race, from *w-album*.

Elwes (Proc. Zool. Soc. Lond. 1881, p. 886) states that W. B. Pryer found *T. w-album* at Shanghai* and Bremer at Peking.

Distribution. Central and South Europe, Siberia, Amurland, Japan.

Thecla patrius. (Plate XXIX. fig. 11, ♂.)

Thecla patrius, Lecch, Entomologist, xxiv., Suppl. p. 58 (June 1891).

Resembles *T. w-album* from Europe, but in the males the sexual mark is oval in shape and the tails are longer. The principal distinctions, however, are found in the markings of the under surface, where the transverse lines are more oblique; that on the secondaries starts from beyond the middle of costa; the orange band is broader, and is followed by two large velvety black spots; the orange band is preceded and followed by a metallic bluish line; the primaries have a pale submarginal line, which in the male merges into orange towards inner angle.

Expanse 33 millim.

A large number of specimens, including both sexes, from Pu-tsu-fong, taken at an elevation of about 10,000 feet in June and July.

Thecla eximia. (Plate XXIX. figs. 1 ♂, 2, 3, var.)

Thecla w-album, var. *eximia*, Fixsen, Rom. sur Léop. iii. p. 271, pl. xiii. fig. 2 (1887).

Thecla affinis, Staudinger, op. cit. vi. p. 148 (1892).

Male. Fuliginous brown. Primaries have a large well-defined glandular patch agreeing in shape better with that of *T. spini* than *T. w-album*. Secondaries as in *T. w-album*, but the tails are longer and the reddish patch on anal lobe is brighter and larger. Fringes are white, but in some specimens suffused with dusky. Under surface olivaceous grey: primaries traversed

* I have seen Pryer's Shanghai specimens in Mr. Elwes's collection and find that they are male examples of *T. eximia*, Fixsen (= *affinis*, Staudinger). The specimens recorded by Bremer from Peking are probably also referable to that species.

by a white line internally bordered with black, this line is divided by the nervules into eight portions, the lower set inwards; marginal line is white, bordered inwardly with blackish, and preceded on the submarginal area by a series of black lunulated marks, bordered with whitish and extending from inner margin to just beyond the middle of the wing: secondaries have a white line, interrupted by the nervules and forming an open **W** before terminating on abdominal margin: anal half of the outer marginal area reddish, enclosing a large velvety-black spot placed in first median interspace and a bluish patch in submedian interspace; anal lobe velvety black: between the reddish colour and costa there is a series of blackish spots bordered with white: marginal line white.

Female rather browner than the male above and paler beneath: markings similar on the under surface.

Expanse, ♂ 40 millim., ♀ 46 millim.

Var. **fixseni**, var. nov. (Plate XXIX, figs. 2 ♀, 3 ♂.) In this form the sexes have, on the upper surface, a fulvous patch on the disc of the primaries, intersected by the nervules and some fulvous spots above anal angle. All these markings are much larger in the female than in the male. The under surface is typical.

This species is distinguished from *T. w-album* by its larger size, longer tails, and more conspicuous red patches on anal lobe. On the under surface the white line of primaries is not angled inwards as in *w-album*, and the angles of the **W** on secondaries are rounded; the reddish band is broader and does not extend along the outer margin beyond the second median nervule.

From *T. grandis*, Felder, it is separated on the upper surface by the more distinct sexual mark of the male, and on the under surface by the much less conspicuous black spots on submarginal area: the spots in *T. grandis* are very large, well defined, and form a series from costa to inner margin on all the wings.

Fixsen's type of *T. eximia* was from Corea and that of Staudinger's *affinis* from Amurland. I have received specimens from Moupin, Wa-shan, and Wa-ssu-kow in Western China, and Dr. Staudinger has sent me a female specimen of *affinis* taken by Hertz in the neighbourhood of Pekin, which agrees exactly with some of my Western Chinese specimens of *T. eximia*.

Thecla grandis.

Thecla grandis, Felder, Wien. ent. Mon. vi. p. 24 (1862).

Thecla ecetria, Hewitson, Ill. Diurn. Lep. (*Lycænidæ*), p. 114, pl. xlii. fig. 153 (1869).

“Alis supra fuscis, posticis linea marginali interrupta alba, omnibus subtus multo pallidioribus, striga pone discum alba angusta, fusco intus cineta marginem internum versus valde refracta, maculis exterioribus nigricantibus albidis cinetis, in posticis lunulis aurantiacis magnitudine increscentibus adnatis, his macula inter ramos primores medianos alteraque anali atris, tertia interjecta glauca.

"Ningpo.—Unicum specimen pessime conservatum ante nos habemus. Tertia fere parte majus est quam *Th. spini*, Wien. Verz., et ab omnibus speciebus europæis costa alarum anticarum omnino convexa ramo ultimo subcostali vix deflexo in costa apicem excurrente caudisque longioribus discrepat." (*Felder, l. c.*)

Felder does not mention the sex of his type, but Dr. Rogenhofer has been good enough to send me a beautifully executed figure of the specimen, and from this it is distinctly seen to be a female.

The male differs from the female in having the ground-colour darker and a well-defined sexual mark on the primaries, similar in shape to that of *T. spini*. The different formation of the sexual character will in itself serve to distinguish this species from *T. w-album*.

Hewitson also describes the female of this species under the name of *etevria*, as follows:—

"*Female*. Dark brown. Posterior wing with two tails (one very short); the outer margin dark brown, with a submarginal line and the fringe white; three or four spots near the anal angle; the lobe black, marked by a small scarlet spot. Underside rufous. Both wings crossed beyond the middle by a linear white band, bordered inwardly with brown; both wings with a band of dark brown spots, bordered on both sides with white, bisected on the posterior wing by bands of orange; a large space of orange at the anal angle marked with a large black spot between the tails, the lobes black, the space between them brown irrorated with white; both wings with the margin brown; a submarginal line and the fringe white.

"Expand $1\frac{7}{10}$ inch.

"In the Collection of the British Museum, from N. China." (*Hewitson, l. c.*)

I have examples of both sexes of *T. grandis* from Kiukiang. It appears to be a scarce species, and, so far, has only been recorded from North China, Ningpo, and Kiukiang.

Thecla pruni.

Papilio pruni, Linnaeus, Faun. Succ. p. 283 (1761); Esper, Schmett. i. 1, pl. xix. fig. 3, pl. xxxix. fig. 1 a; Hübner, Eur. Schmett. i. figs. 386, 387.

Thecla pruni, Laug, Butt. Eur. p. 80, pl. xviii. fig. 1 (1884); Pryer, Rhop. Nihon. p. 15, pl. iv. fig. 15 (1887).

"Expands 0.87 to 1.12 inch. Wings brownish black. The fore wings in the female, and sometimes in the male, exhibit faint traces of a brownish-orange band running parallel to the hind margin. The hind wings have a short tail somewhat like that of *T. spini*, and parallel to the hind margin is a row of well-defined semilunar spots of an orange-brown colour, decreasing as they approach the costa. The colour of the underside is paler than that above. The fore wings have a bluish-white interrupted line running from the costa to the inner margin. The hind wings have a similar line which does not assume a **W**-shape. The hind margin has an orange band bordered with bluish white, and having a row of black spots, one

being placed in each inter-neural space. Fringes black. Antennæ black, ringed with white." (*Looy, l. c.*)

Larva. "Green, darker on the back; two rows of long yellow spots on the back, and a row on each side above the legs; six long oblique yellow stripes on each side." (*Stainton, from Duponchel.*)

"Feeds on the leaves of *Prunus spinosa*, on the twigs of which the eggs are laid in the summer and remain all the winter, the larva appearing in May.

Pupa. "Obese, blunt-headed, and hump-backed; it has a medio-dorsal series of five rather conspicuous warts or tubercles." (*Newman, from Hübnér.*)

The larva and pupa of this species are figured in Buckler's 'Larvæ of British Butterflies,' pl. xii. figs. 5-5 c.

There was a female example from Yesso in Pryer's collection. This specimen is much suffused with pale fulvous on the upper surface, and is figured in his 'Rhop. Nihonica.'

Fixsen records one female specimen from Corea, and comparing it with European examples says that it has a sharper design; the submarginal row of spots on primaries is more distinct and bordered internally with white; the series of black spots which bounds the broader reddish-brown band of secondaries is also more strongly marked with white.

Graeser (Berl. ent. Zeit. 1888, p. 72) records two female specimens from Pokrofska. Staudinger states that Dörries bred this insect in the Sutschan district, and Elwes (Proc. Zool. Soc. Lond. 1881, p. 886) says that *T. pruni* occurs at Vladivostock, and on the lower Ussuri.

Thecla prunoides.

Thecla prunoides, Staudinger, Rom. sur Léop. iii. p. 129, pl. vi. figs. 1 a, b (1887);
Fixsen, tom. cit. p. 278.

"Nearest allied to *T. pruni*, but smaller (25 to 27 millim.), the similar-coloured dark upper surface does not exhibit, in any of the five specimens before me, any trace of yellow-brown spots, which are always more or less conspicuous at the anal angle of *pruni*. The male does not exhibit the sexual patch beyond the cell, which is present in *T. pruni*; but there appears to be in the male of *prunoides* a similar lighter spot at the lower end of the discoidal cell, but this may be owing to abrasion of the scales. The tails of the hind wing are longer than in *pruni*. On the yellowish-grey underside of the fore wing only one row of white spots is present; there are no black outer spots as in *pruni*. The underside of the hind wing is very similar to *pruni*, but the black spots before the outer margin are much less distinct, smaller, and not so sharply bordered with white internally; there is only one black spot on the outer margin above the tail, and not several as in *pruni*. The head and body are not materially different in the two species." (*Staudinger, l. c.*)

Fixsen records a male and female taken at Pung-tung, Corea, in June; he states that in the female specimen there are two light brown patches on the

fore wing similar to those in *T. spini*, ♀ ab. *lynceus*, and *ilicis*, ab. *cerri*, and suggests for this form the name *fulva* or *fulvofoveistrata*.

Staudinger's types are from Amurland, and he also records this species from Japan; he has since informed me that on further examination he considers the Japanese specimens to be referable to *T. pruni*, but adds that he has an undoubted female of *T. prunoides* from the Altai.

Thecla rubicundula. (Plate XXIX. fig. 8, ♀.)

Thecla rubicundula, Leech, Entomologist, xxiii. p. 40 (1890).

Female. Fuliginous brown. Primaries with a discal reddish-orange suffusion. The tail of secondaries hardly darker, narrowly tipped with white; fringes grey. Under surface brown: outer margin of primaries broadly tinged with reddish orange; central transverse line white, bordered internally with dark brownish; there are some indications of a submarginal series of black dots: central transverse line of secondaries white, bordered internally with dark brownish, and bidentated before reaching the abdominal margin; outer margin broadly bordered with reddish orange, and preceded by a submarginal series of small black spots, edged internally with bluish; a black spot at anal angle, and one in the second median interspace; between these is a faintly blue triangular spot.

Expanse 31 millim.

Allied to *Thecla ornata*, but the primaries are paler and the reddish-orange colour does not form a distinct patch; on the under surface the red markings at once separate it both from *T. ornata*, Leech, and *T. r-album*, Oberthür. It is also closely allied to *T. prunoides*, Staudinger, but the direction of the transverse lines on under surface, the greater extent of the red submarginal band on secondaries, and the series of black spots followed by red lunules on primaries will serve to separate *T. rubicundula* from that species.

Appears to be a local and scarce species. I received two female specimens (originally supposed to be males) from Chang-yang, Central China, where they were taken in June.

Thecla lais, sp. nov. (Plate XXIX. fig. 4, ♀.)

Female. Fuliginous brown. Primaries have an obscure orange patch on the disc, intersected by the second and third median nervules, the portion below the second nervule least evident. Secondaries have a bright orange band on the outer marginal area towards anal angle: this band is separated into three parts by the sub-median nervule and first median nervule. Fringes pale grey-brown, white at the angle of secondaries, and white tipped with black on each side of the tail, which is black with a white apex. Under surface grey-brown: primaries have a series of six linear white spots, bordered internally with blackish, forming a transverse band: secondaries have a slightly oblique central series of five white linear spots, edged inwardly with blackish; submarginal band composed of seven white crescents and two nearly parallel

bars, the last spot of central series almost touches the sixth crescent; beyond the submarginal band are some velvety-black spots, edged outwardly with white towards costa, and followed by a broad deep fulvous band towards anal angle; there are three conspicuous spots on the outer portion of this band—one in first median interspace velvety black, a bright bluish one in submedian interspace, and a velvety-black one occupying the whole of the anal lobe; marginal line black, edged inwardly with white.

Expanse 30 millim.

One female specimen was taken by a native collector at Wa-ssu-kow in July, at an elevation of 5000 feet.

On the upper surface this species resembles *T. v-album*, Oberthür, but, apart from the orange band on secondaries, it may be distinguished by the much less conspicuous orange patch on primaries. The ornamentation of the under surface is also similar to that of *T. v-album*, but the arrangement of the white markings is different, and the blue and black spots on outer margin of secondaries are more distinct; the tails also are rather shorter and broader.

Thecla ornata. (Plate XXIX. fig. 7, ♂.)

Thecla ornata, Leech, Entomologist, xxiii. p. 40 (1890).

Male. Primaries blackish, with a large reddish-orange patch on the disc, intersected by the second and third median nervules; fringes dark grey. Secondaries fuliginous brown, with a short tail at the extremity of the second, and a much longer one at the extremity of the third median nervule; both are black, tipped with white; fringes white, tipped with black and preceded by a black line, which towards anal angle is edged internally with whitish. Under surface olivaceous grey; central transverse line of primaries white, edged internally with black; submarginal series of black spots bordered with white and increasing in size towards inner margin; secondaries have a white central line inwardly edged with black, and uniting in the second median interspace with a submarginal line composed of white-edged black spots, and followed by a reddish-orange patch, which is widest between the second and third median nervules, and hardly to be traced beyond the first median branch; from the abdominal margin, above the orange patch, are two short black-edged oblique lines, approximating at their discal extremities; between the termination of these lines and the juncture of central and submarginal lines is a black-edged white curve; a black spot at anal angle, between which and one in the second median interspace is a pale blue patch, edged internally with black; fringes of all the wings olivaceous grey, preceded by a dark line, which is edged internally with white, especially on the secondaries.

Female. Fuliginous brown, sometimes without reddish-orange patch. Under surface as in the male. Expanse. ♂ 32-34 millim., ♀ 35 millim.

Allied to *T. v-album*, Oberth., but the reddish-orange patch on upper surface of primaries is more in the centre of wing, and the markings of under surface are of a very different character.

Occurs in June and July at Chang-yang, at an elevation of 6000 feet. It does not appear to be found in Western China.

Thecla inflammata.

Thecla inflammata, Alphéraky, Rom. sur Léop. v. p. 102, pl. v. fig. 3, ♀ (1889).

"A *Thecla eximia*, Fixsen, cui valde affinis, differt statura minore, disco anticearum supra macula fulva magna, macula anali fulva posticearum nulla. Subtus, statura excepta, ab *eximia*, Fixsen, non secerni potest. ♀ = 31 mm." (*Alphéraky, l. c.*)

Alphéraky states that *T. inflammata*, of which a single female specimen was taken in July near Heï-Hò in the province of Kan-sou, is smaller than *T. eximia*, but agrees exactly with that species on the under surface of the wings. On the upper surface, however, it exhibits the following differences: a fulvous patch on disc of primaries which begins a little below the second nervure and finishes above the fourth, being placed as in some female specimens of *T. arata*, Bremer; the fulvous spot at anal angle of secondaries which is so distinct in *eximia* is entirely absent in *inflammata*.

Alphéraky considers that this species may prove to be a local form of *T. eximia*; but I think that it agrees better with *T. ornata*, especially in the character of the tails. Probably these two insects may be specifically identical, but it is not possible to arrive at any decision on this point without comparing the specimens. *T. inflammata* has nothing to do with the fulvous-marked form of *T. eximia* (var. *arseni*) described by me in the present work.

Thecla v-album.

Thecla v-album, Oberthür, Etud. d'Entom. xi. p. 20, pl. iv. fig. 23, ♀ (1886); Alphéraky, Rom. sur Léop. v. p. 102 (1889).

"Diffère de *v-album* par ses ailes plus arrondies, sa texture plus délicate, la tache orangée qui orne l'aile supérieure en dessus dans les deux sexes et la direction plus arrondie et parallèle au bord extérieur de la ligne blanche qui traverse l'aile supérieure en dessous.

"En outre, le ♂ de *v-album* tend à avoir le dessus des ailes assez largement saupoudré d'un semis épais d'atomes orangés." (*Oberthür, l. c.*)

This species appears to occur commonly in Western China at Wa-ssu-kow, Ta-chien-lu, and Omei-shan, in June and July, up to an elevation of over 8000 feet.

Alphéraky (*l. c.*) records a female specimen taken by M. Potamine in July 1885, at Ou-pin, which he says is without doubt referable to *T. v-album*, Oberthür.

Thecla percomis, sp. nov. (Plate XXIX. fig. 5, ♂.)

Male. Brownish black. Sexual mark small but distinct. Primaries have a large, somewhat triangular, orange patch on the lower half of the wing intersected by the median nervules and the submedian nerve. Secondaries have a broad orange band, intersected by the nervules, on the lower half of the submarginal area, and a few blue scales at anal angle. Fringes of the ground-colour. Under surface fuliginous: primaries have an interrupted, oblique, silvery-blue, central line, which terminates on the submedian nerve, in close proximity to the submarginal line: the latter represented by three linear silvery-blue spots edged outwardly with black: secondaries have an oblique silvery-blue central line, which is indented just below costa, and forms a **W** before terminating on the abdominal margin: submarginal line composed of a series of silvery-blue crescents, edged outwardly with velvety black, as far as the submedian nerve, from whence it runs parallel with the central line to abdominal margin; there is an orange band on the lower half of submarginal area; the anal lobe is velvety black, as also is a spot placed on the margin in first median interspace, the space between this spot and the anal lobe is also black but less intense; marginal line silvery blue, only distinct towards anal angle.

Expanse 36 millim.

One specimen taken at Omei-shan by a native collector in July, at an elevation of 4000 feet.

This species seems very distinct on the upper surface from any *Thecla* known to me; on the under surface, however, it agrees in some respects with *T. v-album*, but the ground-colour is darker, the markings are silvery blue in colour, and the central line of primaries is oblique, not curved as in *T. v-album*.

Thecla œnone, sp. nov. (Plate XXIX. figs. 6 ♂, 9 ♀.)

Male. Fuliginous-brown, with a cupreous tinge: the sexual glandular patch on primaries is small, but well defined. Secondaries have two black spots, bordered internally with fulvous, above anal angle: a white marginal dash, most distinct towards anal angle. Tails slender, black, narrowly tipped and partially edged with white. Under surface fuliginous grey: the primaries have an oblique white line, formed of five crescents, extending from near costa to first median nerve, and a submarginal series of black spots, externally bordered with whitish, but not well defined towards costa: secondaries have a central white line, interrupted by the nervules and forming a **W** before reaching the abdominal margin: submarginal series of black spots encircled with whitish, the sixth bordered with fulvous and followed by another black spot placed nearer the margin, the seventh is double, and its lower edge bordered with fulvous: anal lobe black, with a dark patch powdered with bluish scales above it; marginal line whitish.

Female. Browner than the male; all the wings have a fulvous submarginal band which does not reach the costa. Under surface as in the male, but the submarginal spots are better defined: the white transverse line on primaries runs almost parallel with outer margin as far as the first median, from whence it is angulated inwards to the submedian. The anal extremity of the abdomen is ornamented with a tuft of velvety-black closely compressed hairs.

Expanse 37 millim.

Three specimens were taken at a high elevation to the north of Ta-chien-lu.

T. anone resembles *T. pruni* on the under surface, but the white lines are straighter and have a well-formed **W** before terminating on abdominal margin; there is much less fulvous colour on marginal area of secondaries, and no trace of this colour on primaries. It also agrees with *T. mera* in some characters, but the sexual mark on primaries is less conspicuous, and the tails of secondaries are more slender than in either of those species.

The only other species of *Thecla* in which I have observed the anal patch of velvety-black hairs referred to above are *T. acaciæ*, a species which I believe has not been recorded from Eastern Asia, and *T. tengstromi*, recently included by Mr. Baker in the genus.

Mr. de Nicéville has recently (Butt. Ind. iii.) created the genus *Chatoprocta* for the reception of *D. odata*, Hewitson, the female of which has a large tuft of densely packed pale ochreous-brown hairs at the extremity of abdomen. Excepting that each has this anal tuft of hairs, the three species referred to above have few characters in common.

Thecla herzi.

Thecla herzi, Fixsen, Rom. sur Léop. iii. p. 279, pl. xiii. fig. 4 (1887).

Thecla phyllodendri, Staudinger, MSS, Elwes, Proc. Zool. Soc. 1881, p. 886.

“Corpore fusco, capitis colore vix obscuriori, palpis supra et extrorsum nigris, intus pilis albidocæruleis, oculis albide circumductis, antennis nigris, albide annulatis, apice fusco, femoribus cinereo-cæruleis, tarsis nigris albo-annulatis.

“Alis supra fuscis; posticis linea limbali tenui albide circumductis; subtus pallidioribus, seriebus punctorum nigrorum albide cinetis duabus parallelis in area limbali, fasciaque fusca, marginem anteriorem versus linea alba limbali obducta, ciliis fuscis grisescentibus.” (*Fixsen, l. c.*)

This species, which Fixsen described from the Corea, has since been met with in various places in Amurland.

Graeser (Berl. ent. Zeit. 1888, p. 72), describes the early stages as follows:—

“*Larva*. Velvety uniform dark green, beneath rather paler blue-green; head shining black. Feeds on *Pyrus*, and is full-grown in the middle of June.

“*Pupa* light green, with a series of broad darker violet-brown lozenges on the back.

“*Imago* appears in July.”

Distribution. Amurland and Corea.

Thecla thalia, sp. nov. (Plate XXX. fig. 15, ♂.)

Male. Upper surface uniform fuliginous brown; male mark placed as in *T. spini*, and fairly distinct. Under surface rather paler; primaries have a black discoidal spot encircled with

whitish; a central transverse row of seven whitish-edged black spots, the upper four united and the seventh placed inwards; a submarginal series of six black spots outlined with whitish; the secondaries have a black discoidal spot and central and submarginal series of black spots, all are outlined with whitish; between the submarginal spots and the whitish marginal line is a bright fulvous band towards anal angle.

Female. Similar to the male, but the wings are more ample and the spots on under surface are larger.

Expanse, ♂ 34-36 millim., ♀ 40 millim.

This species agrees in many respects with *T. herzi*, Fixsen, but the tails of secondaries are much longer, and the spots on under surface are less uniformly arranged.

Examples of both sexes were taken by a native collector at Chang-yang in June and July, at an elevation of 6000 feet.

***Thecla tengstræmi*.**

Lycæna tengstræmi, Erschoff, Lep. Turk. p. 11, pl. i. fig. 8 (1874); Lang, Butt. Eur. p. 146 (1884).

Lycæna tengstræmi, var. *dauidi*, Oberthür, Etud. d'Entom. vi. p. 13, pl. viii. fig. 1 (1881).
Thecla tengstræmi, Baker, Trans. Ent. Soc. Lond. 1891, p. 27.

"Expands 0.75 to 1 inch. Wings uniform brown above, with brownish marginal fringes. Underside brownish grey. All the wings with a hind marginal row of light spots; there are no spots upon the area of the wing." (*Lang, l.c.*)

Var. *dauidi*, Oberthür. "Beaucoup plus grande que *tengstræmi*. En dessus, comme cette espèce, d'un brun velouté moins foncé près la base des ailes que vers le bord extérieur; en dessous, diffère de *tengstræmi* par la dilatation de toutes les taches qui sont, en outre, beaucoup moins rapprochées les unes des autres." (*Oberthür, l.c.*)

M. Oberthür says that the type of *L. tengstræmi* came from Tura and adds: "M. l'Abbé David met with the remarkable geographical form which I have named var. *dauidi* near the north-east frontier of China. The female of this form carries at the anal extremity a short tuft of fine compressed black hair, similar to that of *Thecla acaciæ* and some other species of Lycenidæ. This very important character might serve as the basis upon which to form a new genus, but as the species having this character differ in other material respects, it would not be correct to place them in the same genus."

Mr. George T. Baker, in placing this species in the genus *Thecla*, conclusively proves that both by the neuration and sexual appendages *tengstræmi* is more nearly allied to that genus than to *Lycæna*, and he suggests that its proper position is after *T. lunulata*, Erschoff.

Referring to this species, M. Grun-Grshimailo (Rom. sur L'ép. iv. p. 387) says that in Central Asia two forms occur—the type, which inhabits the prairies, principally at an altitude not exceeding 3200 feet; the other form, which he describes as var. *carbonaria*, and figures on pl. viii. fig. 9, inhabits the sub-alpine zone at about 9000 feet.

The only form of this species occurring in China appears to be var. *davidi*, and, so far as I am aware, the specimens taken by l'Abbé David are the only known examples from that country.

Grun-Grshimailo (Horæ Ross. 1891, p. 452) describes two forms of the species from North-eastern Thibet—var. *tangutica*, from the Dshachar Mountains, and var. *iliensis*, from Suidun. Judging from the description, the former seems to come very near to var. *davidi*, Oberthür.

Genus ZEPHYRUS.

Zephyrus, Dalman, Kong. Vet.-Akad. Hand. xxxvii. pp. 62, 90 (1816); de Nicéville, Butt. Ind. iii. p. 299 (1890).

Dipsas (part.), Westwood, Gen. Diurn. Lep. ii. p. 479 (1852).

“FORE WING large, subtriangular; costa regularly arched, apex subacute, outer margin slightly convex or straight, inner margin straight; costal nerve reaching to about half the length of the wing, terminating just opposite to the apex of the discoidal cell, first subcostal nervule given off from the subcostal nerve at about two thirds the length of the discoidal cell; second subcostal nearer to the apex of the cell than to the base of the first subcostal, third subcostal originating rather nearer to the apex of the wing than of the cell; upper discoidal nervule given off from the subcostal some distance beyond the apex of the cell; middle discocellular nervule nearly straight (slightly concave), upright, lower discocellular longer than the middle discocellular, concave, slightly outwardly oblique; second median nervule given off before the end of the cell; submedian nervule straight.

“HIND WING large, broadly ovate, the extremity of the first median nervule elongated into a fine tail, variable in length (very short in the European *Z. quereus*, Linnaeus, and entirely absent in *Z. khasia*, de Nicéville), and the anal angle produced into a larger or smaller anal lobe; first subcostal nervule arising from the subcostal nerve rather near to but before the apex of the cell; discocellular nervules nearly in one straight line, outwardly oblique, the upper rather shorter than the lower; second median nervule arising just before the lower end of the discoidal cell.

“Eyes hairy.

“Antennæ clavate, the club very gradually formed.

“Palpi somewhat long, obliquely pectinated, the third joint horizontal, the second joint very bristly beneath, third joint naked.

“LARVA short, thick, onisciform, tapering towards each end, clothed with fine short hair. Pupa short, thick, rounded.” (*de Nicéville, l.c.*)

Many species are here included in this genus which, although they do not properly belong to it, seem better placed than in *Thecla*, to which they were originally referred. There is no doubt that several new genera will ultimately have to be created for the reception of these species.

Zephyrus taxila.

Thecla taxila, Bremer, Lep. Ost-Sib. p. 26, pl. iii. fig. 7; p. 95, pl. viii. fig. 2 (1864);

Hewitson, Gen. Diurn. Lep., *Lycenide*, Suppl. p. 16, pl. vi. figs. 16, 17, ♂ (1869).

Dipsas japonica, Murray, Ent. Mo. Mag. xi. p. 169 (1875).

Thecla japonica, Pryer, Rhop. Nihon. p. 11, pl. iv. figs. 7 *a-d* (1887).

Thecla fasciata, Janson, Cistula Entom. ii. p. 272, pl. v. fig. 4 (1878).

Thecla regina, Butler, Proc. Zool. Soc. Lond. 1881, p. 853.

Thecla taxila, var. *aurorina*, Oberthür, Etud. d'Entom. v. p. 18 (1880).

Thecla taxila, var. *ultramarina*, Fixsen, Roum. sur Léop. iii. p. 278 (1887).

♂. Alis supra viridi-micantibus: anticis margine externo nigro; posticis caudatis, late nigro-marginatis. Subtus brunneis; anticis strigâ transversâ albâ in ramum medianum primum desinente, fasciâque submarginali fusca. Posticis strigâ transversâ albâ, apud angulum analem literæ **W** instar, acute angulata, lunulis marginalibus albicantibus biseriatis, angulum analem versus maculis duabus fulvis (basin versus nigro-marginatis), ocellos nigros gerentibus, lineâque præciliari albâ. Ciliis albis.

♀. Alis supra brunneis: subtus ut in mare.

“Alar. exp. 1" 10'.” (*Murray, l. c.*)

Var. *fasciata*, Janson. “Above brownish black, the wings deep black towards the apex, a fine line round the eyes and small spots on the underside of the antennæ white; primaries with a broad purple stripe between the third median and submedian nervures, commencing close to the base and extending about two thirds along the wing, there are also some scattered purple scales in the cell, the fringes of both wings and the apex of the tails white, beneath fuscous brown, the markings very similar to *T. japonica*, Murray, and *taxila*, Brem. Expanse of wings 1 inch 8 lines. Yokohama.” (*Janson, l. c.*)

Var. *regina*, Butler. “♀. Allied to *T. quercus* of Europe and *T. fasciata* of Japan. Primaries above with the basi-internal half, excepting the costal border and veins, bright cobalt-blue, changing to ultramarine, the remainder of these wings dark shining cupreous brown, the fringe tipped with white; secondaries cupreous brown, paler than the primaries, excepting towards the outer margin, fringe tipped with white; body greyish brown. Under surface with almost the pattern of *T. fasciata*, but greyer in tint and with all the markings sharply defined, the white stripe purer in colour, broader and more curved; the primaries with two slender submarginal whitish lines in continuation of the lunulated lines of the secondaries, and enclosing two distinct and a third indistinct blackish spot on the inferior half of the external area; orange spots of secondaries deeper in colour. Expanse of wings 1 inch 5 lines. Tushima and Iburî: July.” (*Butler, l. c.*)

Var. *ultramarina* Fixsen. “The male has a more robust body, a darker blue-green colour, and brighter sheen. The black border of the fore wing is a little broader: on the hind wing the costal and outer margins are more strongly bordered with black. On the under surface the

markings agree with *taxila*, only the **W**-angle is less perfect, and there are no blue scales on its short side." (*Färsen*, l. c.)

Var. *aurorina*, Oberthür. "Differs from the type in having the spots beyond the discoidal cell bright yellow, similar to *Z. quercus*, var. *bellus*, and the under surface is of a golden coppery tint, instead of the usual silvery grey." (*Oberthür*, l. c.)

The above form of the female was taken in the Isle of Askold in the month of August. It is the same form as that described and figured by Bremer (pl. viii. fig. 2), which he considered to be the male of his *taxila*. Oberthür also mentions a female specimen, taken at the same time and place, with bright blue above, as in the same sex of *Z. quercus*.

Oberthür mentions both sexes of this species, but from his remarks it is certain that he had before him females only, and was not aware that the male of *taxila* is green. The true male he refers to *Z. smaragdina*, and says that Hewitson's figure (which very correctly illustrates the *japonica* form of *Z. taxila*) represents *smaragdina*. The figure in question has no discal marks on any of the wings, and these would have been shown if *smaragdina* had been the species figured.

The large race known as *japonica*, Murray, occurs only in Japan and Corea, but the smaller Amurland type is also found in the mountainous parts of Japan and in Yesso. The phases of variation in each of these races is exactly similar, and the following table has been drawn up to facilitate reference to the different forms of the female:—

	<i>taxila</i> .	var. <i>japonica</i> .
♀ unicolorous	Brem. Lep. Ost-Sib. p. 26, pl. iii. fig. 7.	Pryer, Rhop. Nihon. pl. iv. fig. 7 b.
♀ with yellow markings beyond cell of primaries.	<i>aurorina</i> , Oberth. Ober. Et. Ent. v. p. 118; Brem. Lep. Ost-Sib. pl. viii. fig. 2.	Not named or figured.
♀ with blue streak and cell on primaries.	<i>regina</i> , Butl. Waterhouse, Aid, pl. 114.	<i>fasciata</i> , Janson. Pryer, Rhop. Nihon. pl. iv. fig. 7 c.
♀ with blue streak and cell, and yellow markings beyond cell (primaries).	Brem. Lep. Ost-Sib. p. 95 (nec pl. viii. fig. 2).	Pryer, Rhop. Nihon. pl. iv. fig. 7 d.

I met with this species commonly in Corea and Japan from the end of June to the end of August, and captured examples of the four forms of the female referred to above.

Fixsen (Rom. sur Lép. iii.) devotes five pages in attempting to prove that *taxila*, Bremer, is specifically different from *fasciata*, Janson; it is, however, not possible to follow his remarks without seeing the actual specimens he had under observation at the time of writing.

Græser, who states that the larva of *Z. taxila* feeds on *Alnus icana* in July, also records a gynandrous example of the imago from Amurland. In this specimen the right side is like the male and the left side like the female.

Pryer states that the males are very pugnacious; the alder is their favourite tree, and they sit on its leaves waiting for any passing rival.

Zephyrus smaragdina.

Thecla smaragdina, Bremer, Lep. Ost-Sib. p. 25, pl. iii. fig. 5 (1864); Oberthür, Etud. d'Entom. v. p. 18 (1880); Pryer, Rhop. Nihon. p. 13, pl. iv. figs. 6a, 6b (1886).

Thecla diamantina, Oberthür, Etud. d'Entom. v. p. 18, pl. i. fig. 1 (1880).

"Alæ supra viridi-micantes ciliis albis; antice margine posteriore nigro; postice caudate, late nigro-fusco-marginatæ. Alæ subtus caucæ striga discoidali abbreviata fusca albo-marginata, striga transversa alba, fusco-marginata fasciæque submarginali fusca. Alæ postice striga discoidali obsolete fusca albo-marginata, striga transversa alba antice fusco-marginata, apud angulum ani literæ **W** instar obtuse angulata; lunulis marginalibus albis biseriatis; macula anguli ani fulva nigro-marginata ocelloque fulvo nigro-pupillato. 35-37 m." (*Bremer, l. c.*)

The special characters of *Z. smaragdina* appear to be the golden green colour and broad black borders to all the wings in the male. The females seem always to have fulvous spots beyond the cell of primaries, and, so far as I am aware, are not dimorphic. On the under surface the discal markings are always present, and in addition there is usually, but not always, a pale dash outwardly bordered with darker below costa of secondaries towards the base.

I entirely agree with Mr. Elwes (Proc. Zool. Soc. Lond. 1881, p. 884) in considering *diamantina*, Oberthür, synonymous with *smaragdina*.

Dr. Staudinger says that *diamantina* is not to be distinguished from *Z. orientalis*, but I cannot understand how he arrived at such a conclusion; if he had studied Oberthür's description and examined the figure and then determined *diamantina* to be identical with *orientalis* he must have ignored

both colour and markings. Oberthür says of his *diamantina*: "En dessus, d'un vert doré brillant avec bordure assez large noire." The brilliant golden green can only apply to *smaragdina*, Bremer, or *brilliantina*, Staudinger*, and does not at all express the colour of *orientalis*, which is a pale bluish green. The broad black marginal borders are certainly like those of *Z. orientalis*, var. *cognata*, but if *diamantina* were really a form of *orientalis*, then the broad black margins would have rendered the description of var. *cognata* unnecessary.

Dörries bred this species in Askold, and Graeser (Berl. ent. Zeit. 1888, p. 72) says that the larvæ are abundant in Amurland on *Quercus mongolica*. The imago occurs in the middle of July.

It is found in mountainous parts of Central Japan and Yesso in July and August. I have also received specimens from Chang-yang, Central China.

I should mention that in consequence of my absence from England at the time my paper on the Butterflies of Japan and Corea was passing through the press I was unable to check the distribution table, hence one or two species, including *Z. smaragdina*, were erroneously included therein as occurring in Corea.

Zephyrus coruscans, sp. nov. (Plate XXVII. figs. 7 ♀, 8 ♂.)

Male. Something similar in colour to *Z. lucila*, var. *japonica*, but more brilliant; the black borders of all the wings are broader, especially on the primaries, where the band expands considerably towards apex; the tails are longer, and the angulation above them is more produced, giving the appearance of a second short tail on each of the secondaries. Under surface darker than that of *japonica*, but the markings are similar, the principal differences being the broader and straighter white central bands on all the wings, that on the secondaries starts from a point nearer the middle of the costa; the submarginal pair of lines are wider apart, and the outer one is bluish and diffuse; there is a white spot towards the costa near the base of secondaries, and another linear one, edged with black, about the middle of abdominal margin.

Female. Deep fuliginous brown; there are three orange spots on the disc separated by the second and third median nervules. Under surface as in the male.

Expanse, ♂ 47-52 millim., ♀ 46-50 millim.

* Staudinger (Rom. sur Léop. iii. p. 130) states that *brilliantina* is not separable from *smaragdina* on the upper surface, and that there are only very trifling differences on the under surface. The larvæ, however, are very distinct and easily distinguished: that of *brilliantina* feeds on oak, and is copper-coloured, with a dark dorsal line, pale segmental divisions, and a pair of oblique streaks on the back of each segment; the larva of *smaragdina* feeds on cherry, and is yellow, with very striking black spots on the first, fourth, and eleventh segments.

I have specimens of this species from Moupin, Ni-tou, and Omei-shan, where they were taken in July and August, at elevations ranging from 5000 feet to 8000 feet.

The female of this species is not unlike that of *Z. smaragdina*, Brem., on the upper surface.

The greater prominence of the white markings of the under surface and the longer tails at once separate *coruscans* from all the other green species of *Zephyrus*.

Zephyrus desgodinsi.

Thecla desgodinsi, Oberthür, Etud. d'Entom. xi. p. 21, pl. vii. fig. 54 (1886).

"Plus grande que *Tsangkie*: ailes d'une contecture délicate, brunes en dessus avec une tache orangée bilobée à peu près comme dans *Tsangkie* ♀. Dessous d'un brun uniforme avec à peu près les mêmes dessins que dans *Tsangkie*. Mais le bord des ailes inférieures est semé d'atomes blancs jusqu'à la rencontre d'une ligne un peu sinueuse, blanche, très fine, presque parallèle à la ligne ordinaire blanche, qui est le prolongement de celle qui descend du bord costal de l'aile supérieure et qui se termine par une sorte de V près du bord anal. De plus, l'espace cellulaire est clos par un trait brun foncé liseré de blanc extérieurement à cette tache brune à l'aile supérieure et intérieurement à l'aile inférieure. Une ombre brune accompagne intérieurement la ligne blanche de l'aile supérieure et une autre ombre brune monte de l'angle interne vers le bord antérieur, entre cette ligne blanche et le bord externe." (Oberthür, l. c.)

Oberthür's type, which is a female, was taken at Ta-chien-lu in Western China.

The male, when discovered, will probably be found to be green.

My collectors did not meet with this species in any part of China that they visited.

Zephyrus ataxus. (Plate XXVII. figs. 5 ♂, 6 ♀.)

Dipsas ataxus, Hewitson, Doubleday & Hewitson, Gen. Diurn. Lep. ii. p. 480, pl. lxxiv. fig. 7, ♂ (1852); Horsfield & Moore, Cat. Lep. Mus. E. I. C. i. p. 31 (1857); Hewitson, Ill. Diurn. Lep. p. 65, pl. xxvi. fig. 6 ♂ (1865).

Zephyrus ataxus, de Nicéville, Butt. Ind. iii. p. 303 (1890).

Dipsas katawa, Hewitson, Ill. Diurn. Lep. p. 65, pl. xxvi. figs. 1, 2, ♀ (1865).

Zephyrus katawa, de Nicéville, l. c.

Male. Agrees in colour with *Z. taxila*, var. *japonica*, but the black borders are very narrow, and the tails are long and slender. Under surface pale silvery grey; the only markings on the primaries are an elongate black discoidal spot, some indications on the costa of central band and a black spot in the first median interspace, with some faint dusky lunules in the interspaces above it:

the secondaries have a broad central band represented as far as the median nervure by two blackish-brown lines, below the median are some irregular-shaped blackish-brown marks; the submarginal band is composed of two crenulated blackish-brown lines; there is a large velvety-black spot surrounded with fulvous in the first median interspace, a similar spot at anal angle; the latter is preceded by a fulvous patch, and there are streaks of the same colour a short distance along the abdominal margin and along the submarginal band to the spot in median interspace; marginal band interrupted, dusky, and not well defined.

Expanse 52 millim.

Female. Primaries blackish; the discoidal cell is filled up with bright blue, and there is a broad streak of the same colour in the submedian interspace; an orange spot lies beyond the cell, and this is separated by the third median nervule from a similar spot in the second median interspace. Secondaries fuliginous. Fringes whitish. Under surface grey-brown: the primaries have a darker discoidal spot outlined with white, and a broad silvery central white band bordered on each side with a darker shade of the ground-colour, and terminating on the first median nervule; submarginal line silvery white, preceded by an ill-defined whitish band; secondaries silvery white, clouded with grey-brown at the base; central band dark grey-brown, interrupted below the median nervure, its continuation uniting with a patch of the same colour on abdominal margin; the outer fourth of the wing dark grey-brown, thickly powdered with silvery-white scales towards margin; submarginal line silvery white, but very ill defined; marginal line silvery white; there is a large velvety-black spot, surrounded with fulvous, in the first median interspace, and a similar spot at anal angle, the latter is preceded by a fulvous patch, and there is a streak of the same colour along the abdominal margin and another along the submarginal line to the spot in median interspace.

Expanse 46 millim.

Appears to be an exceedingly rare species in Western China; the only specimens that I have received are a male and a female taken by Kricheldorf at Moupin in June.

As will be seen from the figure of the male (pl. xxvii. fig. 5) the black margins of all the wings are much narrower than in typical *ataxus*; but as I have only one example of this sex from Western China, I am unable to say whether this is a constant character.

Mr. de Nicéville (*l. c.*) states that *Z. ataxus* is very rare in India; the only records that he has of its capture are from Massuri, where both sexes were taken in June and July at an elevation of 7000 feet, and a small example of the female taken by Capt. Young in Kulu.

There were no specimens in the collection of the late Otto Möller from Darjiling, now in my possession; and Mr. Elwes does not include it in his List of the Butterflies of Sikkim, although Horsfield and Moore record it from Darjiling. Westwood says that the type came from Simla.

There can be no doubt that the insects described by Hewitson as *ataxus* and *katura* are sexes of one species.

Zephyrus scintillans, sp. nov. (Plate XXVII. figs. 10 ♀, 11 ♂.)

Male. Similar to the same sex of *Z. orientalis*, but much rounder in the wing; colour similar but much brighter. Outer margins of all the wings broadly black, as also is the costa of secondaries and the outer two thirds of the costa of primaries, but the latter more narrowly. Tails very long and slender; towards anal angle is a pale blue submarginal line, a character which, so far as I am aware, only occurs in this species and in *Z. orientalis*. Under surface brownish grey; the discoidal bars on all the wings well defined and bordered with white; transverse band white, internally bordered with dark brown; a submarginal series of dark spots, bordered on each side with white and disappearing towards apex; a dark brown marginal line bordered inwardly by a white one. Secondaries marked as in *Z. orientalis*, but the **W** towards anal angle is complete and quite differently angled to that species; the submarginal band of secondaries is much more suffused with white; the black spot in the reddish spot above the tail is larger. Fringes white, edged with black at anal angle.

Female. Dark brown; there is a fulvous patch at the end of cell, followed by two other patches beyond, one in each median interspace; there is also a fulvous patch above the tail; the submarginal line is blue towards anal angle, as in the male. Under surface like the male, but the ground-colour is dark brown.

I have only received examples of this species from Chang-yang, in Central China, where they were captured in July.

On the upper surface the female somewhat resembles a specimen sent to me by Dr. Staudinger, which he considers to be either a dimorphic form of *Z. orientalis*, var. *cognata*, Staud., or a hybrid between *Z. orientalis* and *Z. taxila*.

Dr. Staudinger has also sent me typical examples of both sexes of his var. *cognata*, together with an intermediate form connecting *cognata* with *orientalis*. Apart from the other characters referred to in the above description of *Z. scintillans* the formation of the **W** on under surface of secondaries is quite sufficient to distinguish this species from *Z. orientalis*, var. *cognata*.

There is no tendency whatever to variation among my specimens of *Z. orientalis* or *Z. smaragdina* from Chang-yang.

Zephyrus orientalis. (Plate XXVII. fig. 14, var.)

Dipsus orientalis, Murray, Ent. Mo. Mag. xi. p. 169 (1875).

Thecla orientalis, Janson, Cistula Entom. ii. p. 156 (1877); Pryer, Rhop. Nihou. p. 14, pl. iv. figs. 8 a, 8 b (1886); Fixsen, Rom. sur Lép. iii. p. 278 (1887).

Female. " Alis suprà brunneis, anticis ad apicem marginemque exteriorem saturatioribus, macula magnà pallida obliqua, posticis caudatis. Alis subtus canis: anticis strigà disco-cellulari fusca, strigà transversà alba basin versus fusco-marginatà, in ramum medianum primum desinente, maculisque obsolete præmarginalibus fuscis, albo-marginatis: posticis strigà disco-cellulari obsolete fusca, strigà transversà albà, basin versus fusco-marginatà, apud angulum

analem literæ **W** instar obtuse angulatâ, lunulis præmarginalibus albis biseriatis, macula elongatâ marginis interioris (prope angulum analem) maculaque ad eandem radicem nigro-pupillatâ, fulvis, lineaque præciliari alba.

“Alar. exp. 1” 7””. Hab. Japoniam.”

Female. “Very closely allied to *D. tavila*, Brem. The fore wings are brown, darker at the apex and along the hind margin, and possess in the male [female] a yellowish square patch at the end of the cell, which is continued obliquely in the direction of a point on the hind margin a little above the anal angle. This portion is ill defined. On the underside the pattern of the wings much resembles that of *D. tavila*, but the transverse streak of fore wing is longer than in that species (judging from Bremer’s figure), and the streak on the hind wing is distinctly angulated in the form of a **W**, which does not appear to be the case in the allied species.” (*Murray, l. c.*)

The male of *orientalis* is referred to by Janson (*l. c.*) as follows:—
“Although Mr. Murray states his description is of the male of this species, it is evident he had never seen that sex, as several individuals recently received from Japan exhibit a similar sexual dissimilarity to that extant in *T. japonica*, being of a brilliant green above, paler than in that species, and without the black external margin to primaries, the underside agrees perfectly with the female.

“This is a much rarer species than *japonica*, and the male was not discovered until last year [1876], when Messrs. Pryer and Jonas took several in company with the females near Yokohama.” (*Janson, l. c.*)

The larva, according to Dörries, is ash-coloured, and feeds on oak.

Occurs plentifully all over Japan and at Gensan, Corea, from the end of June to the beginning of August. Pryer gives Yokohama, Asama-Yama, Nikko, and Yesso as localities, and says that it appears at the same time as *T. japonica*. I have received the species from Wa-ssu-kow, Moupin, and Ta-chien-lu in Western China, and from Chang-yang, Central China.

Var. *suffusa*, var. nov. (Plate XXVII. fig. 14, ♂.) *Male.* Bluish-green, with a strong purplish-grey suffusion, in certain lights the green colour is only apparent on the costa and outer margin of primaries. Primaries have a moderately broad black border, suddenly increasing in width from below first median nervule to inner margin. Secondaries are broadly bordered with black, but the inner edge is not clearly defined; there is no blue submarginal line as in the type, the tail is also broader and rather shorter. Under surface pale drab; the markings very similar to those of the type, but the white ones are broader and the dark ones less conspicuous; there is no trace of a discoidal spot on primaries, and the inner white line of the submarginal pair on secondaries is placed near the central band, consequently it is farther removed from its companion than in the type.

Expanse 48 millim.

One example of this form was taken by a native collector at Omei-shan in July at 5000 feet elevation.

This species differs considerably in colour, shape, and size from the other green species of *Zephyrus*; the discoidal bar on each wing is subject to modification in the direction of complete effacement.

The female exhibits very little variation on the upper surface either in colour or marking, but there is one specimen from Moupin with a broad blue stripe above inner margin and a blue suffusion in the discoidal cell, as in female *Z. tavila*, var. *fasciata*.

Many male specimens of this and other species of *Zephyrus* in collections have a purplish suffusion. I have captured numerous examples of this species and *Z. tavila*, var. *japonica*, but never observed this suffusion in the specimens when alive; probably, therefore, the change in colour is due to some chemical action which takes place either in the killing, setting, or relaxing of the insects. Var. *coquata*, Stgr., has not so far been met with in the region here dealt with.

***Zephyrus pedius*, sp. nov. (Plate XXVII. fig. 3, ♀.)**

Female. Similar to the type of the same sex of *Z. orientalis*, Murray, but much darker in colour; the pale patch on primaries is of the same shape and placed in the same position, but it is yellowish in colour; there are no indications of a bluish marginal line on secondaries. The under surface is silky pale greyish white, which obscures all the whitish markings, leaving distinct only the dark lines, and even those on the secondaries are only faintly indicated; the orange markings on outer margin of secondaries are the same as in the type, but that at anal angle is not continued above any part of the abdominal margin as it is in *Z. orientalis*.

Expanso 41 millim.

One example taken by a native collector at Wa-ssu-kow, in July, at an elevation of 5000 feet. The male, when discovered, will probably prove to be green.

***Zephyrus saphirina*.**

Thecla saphirina, Staudinger, Rom. sur Lép. iii. p. 135, pl. xvi. figs. 3, 4, 5 (1887); Pryer, Rhop. Nihon. p. 14, pl. iv. figs. 9a, 9b (1888).

Smaller than the other green *Thecla* and with shorter tails. *Male* dark blue-green, less shining than other species. Primaries have only a black marginal line, the secondaries have a narrow black border. Fringes in both sexes white on lower half of secondaries and at inner angle of primaries. *Female* dark grey, deep black at apex and on outer margin of primaries.

Under surface in both sexes quite different in colour and markings to the other species. It is mother of pearl (silver), shining whitish grey, similar to that of *syla*, Koll., from N. India. The fore wings have beyond the middle a strong dark brownish-grey streak, and beyond this a somewhat broad dark curved band from costa to first median; before the outer margin is a double series of dusky lunules." (*Staudinger, l. c.*)

Male. Bluish green; secondaries broadly bordered with black. Fringe whitish.

Female. Brownish; primaries rather paler on disc, and with some pale spots beyond the discoidal cell.

Under surface pale bluish white in the male, and whitish grey in the female; the primaries have the following dusky markings: a bar at the outer extremity of the discoidal cell, an oblique dusky band bordered outwardly with white, and a submarginal series of spots; secondaries have a discoidal bar and interrupted dark grey central band bordered with whitish; there is a double whitish wavy submarginal line and a line of the same colour parallel with outer margin; a black spot bordered with fulvous at anal angle, and above it there is another black spot surrounded with fulvous in the first median interspace.

Expanse, ♂ 36-38 millim., ♀ 31-38 millim.

Graeser states that the larva feeds in June on *Quercus mongolica*.

This insect, which is described by Staudinger from the coast region of Amurland, also occurs in Yesso; there was a large series in the late Henry Pryer's collection from the latter locality. Dr. Fissen records a female specimen from Corea, taken in July.

Zephyrus hecale, sp. nov. (Plate XXVII. figs. 1 ♀, 2 ♂.)

Male. Of the same green colour as *T. taicila*, but much suffused with blackish in certain lights; the black marginal borders of the primaries are very broad, and those of the secondaries still broader, the abdominal margin of these wings is also broadly blackish; the primaries have an elongate black discoidal spot. Under surface similar in colour and pattern to that of *Z. taicila*, but the white markings are silvery and more slender; the primaries have a dark discoidal spot bordered with silvery white, the central line of secondaries forms a more distinct **W** before reaching abdominal margin, and the inner submarginal line on these wings is not well defined; the tails are rather longer.

Female. Blackish; the primaries have an orange spot at the outer extremity of discoidal cell, and one between it and the outer margin intersected by the third median nervule. Under surface as in the male, but the central lines are rather wider.

Expanse, ♂ 42 millim., ♀ 38 millim.

The male of this species was taken at Wa-ssu-kow in July, at an elevation of 5000 feet, whilst two females were captured at Ta-chien-lu in July, at about 8000 feet.

This species is also allied to *Z. (T.) tsungkie*, Oberthür, but the male has no purplish blue at angle of secondaries, and the female is not marked with blue on upper surface; the orange markings on primaries are more like those

of female *Z. icana*, Moore. The fringes of both sexes are darker and the white transverse lines on under surface are wavy.

Zephyrus tsangkie.

Thecla tsangkie, Oberthür, Etud. d'Entom. ix. p. 20, pl. vii. figs. 55 ♂, 56 ♀ (1886).

“Appartient au groupe de *syla*, *japonica*, *tavila*, *orientalis*. En dessus, le ♂ a le disque des ailes couvert d'atomes vert brillant, les nervures sont dessinées en brun noirâtre, le contour des ailes est largement bordé de noirâtre uni, mat. Le bord extérieur, aux ailes inférieures, est orné près de l'angle anal de deux taches bleu brillant, du milieu desquelles sort le petit appendice caudal noir, terminé en blanc.

“La ♀ diffère en dessus du ♂, parce que les ailes sont brunes, les inférieures plus pâles les supérieures plus noires. Celles-ci ont deux belles taches bleu brillant, l'une intracellulaire, l'autre plus longue intracellulaire, et une tache orangée bilobée au delà de la cellule. Le dessous des deux sexes diffère très peu de celui de *japonica*.” (Oberthür, l. c.)

The *male* has the wings thickly powdered with brilliant green scales, the nerves are blackish brown, and the outer margins of all the wings are broadly bordered with black with two bright blue patches, sometimes united towards anal angle of secondaries.

The *female* is brown: primaries are rather darker than the secondaries, and have an elongate patch of blue in the first median interspace, with a smaller one above in the discoidal cell; at the end of the cell there is an orange patch intersected by the nervules.

On the under surface the sexes are alike, and the pattern is very similar to that of *Z. tavila*.

Appears to be a common species in Western China, occurring up to an elevation of 10,000 feet.

Zephyrus icana. (Plate XXVII. fig. 4. ♂.)

Dipsas icana, Moore, Proc. Zool. Soc. Lond. 1874, p. 575, pl. lxxvii. fig. 3, ♂.

Zephyrus icana, de Nicéville, Butt. Ind. iii. p. 306 (1890).

“*Male*. Upperside dark brown: fore wing with the interior portion purplish green, metallic only in certain lights, and traversed by the dark brown veins; hind wing slightly sprinkled with metallic-green scales.

“*Underside* pale sap-brown: fore wing with a dark brown broad spot at end of the cell; a transverse discal band decreasing in width and terminating one third from the posterior angle, being bordered outwardly by a narrow pale line; a narrow paler brown submarginal fascia and outer border: hind wing with a dark brown broad median transverse band including a discocellular spot, the band pale-bordered on both sides and terminating above anal angle in a zigzag line; a paler brown lunular submarginal fascia and outer band; a black-bordered orange patch at anal angle containing two black spots joined by a blue streak.

“Expanse $1\frac{4}{10}$ inch.” (Moore, l. c.)

Occurs in Western China at Chia-kou-ho, Ta-chien-lu, and Omei-shan, in June and July, at an elevation of 10,000 feet.

In India, *Z. icana* is not a common species, it has been obtained at

Narkunda in July and August, on the Jalauri Pass at the end of July, in Kulu at 7000 feet in July, and from 8000 to 9000 feet in September, and also in Kumaon.

Dr. Fixsen (Rom. sur Lép. iii. p. 268) seems to consider *Z. icana*, Moore, synonymous with '*Dipsas micans*, Bremer and Grey; but this species is not in any way to be confounded with *Z. icana*, and is not even congeneric with it.

Zephyrus bieti.

Thecla bieti, Oberthür, Etud. d'Entom. xi. p. 19, pl. iv. fig. 22, ♂ (1886).

"Voisine de *Quercus*, mais d'un bleu plus obscur en dessus et la bordure noire marginale beaucoup plus large. La ♀ diffère du ♂ de la même façon que dans *quercus*, c'est-à-dire par deux taches bleu brillant et deux ou trois points orangés aux ailes supérieures. La frange est brun jaunâtre. Le dessous diffère de *quercus*, parce que la teinte gris argenté est remplacée par du brun saupoudré d'une multitude d'atomes jaune orangé, et que la ligne transversale allant du bord costal des supérieures au bord anal des inférieures est jaune clair et parallèle au bord extérieur. Cette ligne est intérieurement accompagnée d'une ombre rougeâtre très fine et extérieurement d'une bande submarginale de petits croissants rougeâtres. Les espaces cellulaires sont clos par un trait rougeâtre." (Oberthür, l. c.)

Occurs commonly from May to August at Che-tou, Ta-chien-lu, and Moupin in Western China and at How-kow in Thibet. It is found at various elevations up at 10,000 feet.

Zephyrus signata. (Plate XXVII. fig. 12, ♀.)

Thecla signata, Butler, Proc. Zool. Soc. Lond. 1881, p. 854; Waterhouse, Aid Identif. Ins. pl. cxiv. fig. 2 (1882); Pryer, Rhop. Nihou. p. 16, pl. iv. fig. 19 (1886).

"Allied to *T. arata* and *T. tyrianthina*. Primaries above with the discoidal cell, the intermedian interspace almost to outer margin, and the basal half of the median interspaces bright pure lilac, the remainder of the wings and the veins dark brown, shot with lilac; secondaries rather pale fuliginous brown with bronzy reflections, the discoidal cell sprinkled with lilac scales. Wings below pale golden brown; primaries with two slightly darker spots in the cell, margined and partly connected by silvery-white lines; a slightly oblique band from costa to first median branch, edged on both sides with silvery-white lines; a submarginal series of indistinct white lunules, the last two of which bound two dusky spots; internal area shining whitish; fringe dusky; secondaries with two abbreviated silvery-white lines across the base of the subcostal area, the inner one curved; a nearly M-shaped character of the same colour crossed by the median vein; two widely angulated, slender, interrupted white lines from the abdominal margin to the median vein; an oblique white line from the costal margin to the first median branch, and a chain-like double white line from the apex to the second median branch; a large black-spotted orange spot on the anal area (the anal third of the wing is

ragged on both sides: but from what remains of the anal patch, it appears to be of the same character as that of *T. avatti*. Body white, the venter creamy, the tarsi annulated with black. Expanse of wings 1 inch 3 lines.

"Kuramatsunai (Yesso), August. Coll. M. Fenton." (*Batler, l. c.*)

Pryer's figure of *Z. (T.) signata* is a very indifferent one and barely recognizable; he states that the species is not uncommon in Yesso. I have three specimens from that island, which differ *inter se* and from the type, figured in 'Aid,' in the character of the white basal marks on the under surface.

Zephyrus quercivora. (Plate XXVII. fig. 15, ♀.)

Thecla quercivora, Staudinger, Rom. sur Léop. iii. p. 137, pl. vi. figs. 2 a, b (1887).

"I received three bred specimens of this very interesting new species from Dörries, all of which appeared to be females, and closely resembled the same sex of *T. quercus* on the upper surface, but the pale blue of discoidal cell is continued beyond in the form of a streak in each median interspace. The basal portion of the secondaries, especially the cell, is suffused with blue, and the white-tipped black tail is distinctly longer than in *T. quercus*. The fringes are dark, but in one specimen chequered, especially on the secondaries, with white. Under surface ochreous slightly tinted with grey, differs from all other species of *Thecla* (from the Palearctic or Indian Fauna) in having white markings at the base of the secondaries. The large orange anal spot well defined. Antennæ black, ringed with white, with less brown at the tip than in *quercus*; the pectus is clothed with bluish-white hair; the white feet are outwardly marked with black: the tarsi are white, ringed with black, and the abdomen is dark above and yellowish white beneath.

"The larva lives on oak, and is green with brown spots along the back and sides. The first three segments have some darker (blackish) spots, and are clothed with longer and thicker hair than the others: the eleventh segment has a somewhat remarkable conical process, which is not familiar to me in the case of any other Lycaenid larva." (*Staudinger, l. c.*)

Staudinger states that his description of *quercivora* is taken from three bred examples of the female from Amurland, but his figure is said to represent a male.

Two female specimens, kindly lent to me by Mr. Grose Smith, one from Ichang, Central China, and the other from Western China, probably Omeishan, agree with *quercivora*, except that the secondaries have more blue on the upper surface. The figure of *Z. quercivora* agrees with the figure of *Z. signata* in every particular but the character of basal marks on under surface; and as I find that these marks are inconstant in *Z. signata*, I am disposed to think that when more material is available it will be found that *quercivora* is only a form of *Z. signata*. If Dr. Staudinger had been acquainted with the latter species, he certainly would have compared his *quercivora* with it rather than with *quercus*.

Zephyrus cœlistis. (Plate XXVII. fig. 9, ♂.)

Thecla cœlistis, Lecch, Entomologist, xxiii. p. 191 (1890).

Male. Bright blue; primaries with broad black band on outer margins, the apical portion extending nearly to middle of the costa, from this point to the base the costa is edged with black. Secondaries; two black spots just above anal angle (one on each side of submedian nervure); the submarginal band is black and fairly broad at apex, and this colour is continued halfway up the whitish abdominal margin. Fringes greyish, preceded by a black line on the secondaries; tail black, tipped with white. Under surface russet-brown; on the primaries there is an indistinct discal spot, and beyond it an oblique silvery-white line extending from costa to first median branch; submarginal line bluish white, ill defined towards apex, and edged internally with black towards the inner margin, which is broadly grey; secondaries have a silvery-white central transverse line and a bluish-white sinuous submarginal line; the latter is edged internally with blackish, and the former is twice angulated above the anal angle and terminates about the middle of abdominal margin; anal angle is black, and above it is a broad orange-red patch extending from first median nervule to end of central line on abdominal margin; the black spots are reproduced, but that nearest the anal angle has a blue centre; fringes as above, but the black line at their base is preceded by a bluish one towards anal angle.

Female. Similar to the male, but the black band of primaries is much broader and contains an orange patch, which is bisected by the second median nervule; the costa and fringes are tinged with fulvous; the marginal band of secondaries is also broader.

Expanse 42 millim.

Var. **nigricans.** All the wings have a slight blackish suffusion, the apex and outer margin of primaries are very broadly bordered with black; the outer margin of secondaries is also broadly black, and this colour projects from the inner edge of the marginal band along the nervules.

Both forms occur at Ta-chien-lu, Omei-shan, and Moupin, in June and July, up to 8000 feet. The type has only been received from Wa-shan, Pu-tsu-fong, and Ni-ton.

Zephyrus betulæ. (Plate XXVIII. figs. 8, 11, vars.)

Papilio betulæ, Linnaeus, Syst. Nat. x. p. 482 (1758).

Zephyrus betulæ, Kirby, Cat. Diurn. Lep. p. 103 (1871).

Thecla betulæ, Lang, Butt. Eur. p. 75, pl. xvii. fig. 1 (1881).

Thecla elveisi, Lecch, Entomologist, xxiii. p. 39 (1890).

“Expanse 1.25 to 1.50 inch. The ground-colour of the wings in both sexes is dark brown; all the wings have the fringes whitish brown. The head, thorax, and abdomen are black above, but the legs and palpi are white beneath; the antennæ are black, ringed with white. The male has a faintly black oblong discoidal spot on the fore wings, and external to it a light but inconspicuous patch; the hind wings have the tail orange, and a small orange patch at the anal angle. The female differs from the male in having a large and bright orange patch on the fore wings external to the discoidal spot, crossed by two or three black veins, and occupying nearly a fourth of the area of the wings. The underside is nearly the same

in both sexes; the ground-colour is reddish brown, brightest in the female; the fore wings have an elongated discoidal spot, and external to this, reaching from the costa, a long tapering streak of a darker colour, coming to a point as it approaches the inner margin and bounded externally by a white line; the hind wings have a patch of bright reddish brown running from the costa to the inner margin, bounded internally by an indistinct white line and externally by a very distinct wavy line of the same colour; the hind margins are reddish orange.

"*Larva*, when full-grown, is apple-green; the segments are very definitely divided, and each segment has four longitudinal white stripes, two dorsal and two lateral, and besides these several oblique pale lines. The head is brown, and very much smaller than the segment immediately posterior to it.

"*Pupa*.—Pale brown and smooth, not attached by silken threads; in this manner resembling the pupa of *T. quercus*, which also does not attach itself by the head and tail." (*Lang, l. c.*)

Z. betula is represented in China by a large form, which I now describe as

Var. **crassa**, var. nov. (Plate XXVIII. fig. 11, ♀.) *Male*. Agrees exactly in colour with dark specimens of the same sex from Europe, but the tails are longer and more slender. The *female* differs only from European examples of the same sex in having longer tails. On the under surface there is no difference, except that the black spot above the tail is always distinct and the outer transverse line of secondaries is rather less angulated.

Expansion, ♂ 54 millim., ♀ 56 millim.

This form occurs at Moupin, Western China, in July.

Var. **elwesi**, Lecb. (Plate XXVIII. fig. 8, ♀.) *Male*. Fuscous-brown, the discal area of primaries tinged with orange-brown, especially beyond the black bar which closes the discoidal cell. Secondaries with some black spots and orange marks on outer margin at anal angle; tail reddish orange, edged with black and tipped with white. Under surface as in var. *crassa*.

Female. Orange-brown, clouded with greyish brown towards the base of all the wings, apex and outer margin black; a black spot on secondaries in second median interspace; fringes whitish, grey at the base and, on the secondaries, at the extremities of nervules.

Expansion, ♂ 50 millim., ♀ 54 millim.

I have received examples of this form from Chang-yang and Ichang, Central China, and from Moupin in Western China. Occurs in July and August.

When I described *elwesi* as a distinct species, I supposed that the larger size and different coloration of upper surface were of specific value; but since receiving other specimens, not only of *elwesi* but also of *crassa*, from Moupin, I am now inclined to consider both as exaggerated forms of *Z. betula*.

Zephyrus sæpestriata.

Dipsus sæpestriata, Hewitson, Ill. Diurn. Lep. p. 67, pl. xxvi. figs. 7, 8 (1865); Pryer, Rhop. Nilon. p. 13, pl. iv. fig. 5 (1886).

- “*Male*. Upperside orange-yellow (the bands of the underside indistinctly seen through); the outer margins dark brown, narrow: a black spot marked with a spot of white at the anal angle. Underside orange-yellow. Both wings crossed transversely by numerous bands and spots of brown. Posterior wings orange at the base of the tail, marked with two black spots.
- “*Female* differs from the male in having the apex of the anterior wing broadly brown; two black spots near the base of the tail; and the outer margin of the posterior wing broader, traversed near the tail by a line of white.
- “Exp. $1\frac{8}{10}$ inch.” (*Hewitson, l. c.*)

According to Pryer this species is common at Yokohama. I took it in July near Nagahama, Lake Biwa, and also at Hakodate. Mr. Elwes states that this insect was taken at Vladivostock by Dörries (*Proc. Zool. Soc. Lond, 1881, p. 883*).

Zephyrus jonasi.

Thecla jonasi, Janson, *Cistula Entom. ii. p. 157* (1877); Oberthür, *Etud. d'Entom. vi. p. 13, pl. viii, fig. 2* (1881).

Dipsas jonasi, Pryer, *Rhop. Nihon, p. 13, pl. iv, fig. 5* (1886).

- “♀. Above orange, slightly golden, base of wings blackish; primaries with an apical black border, wide in front but narrowed towards the inner angle; secondaries somewhat produced at the apical angle, tails black, tipped with white, margin between the tail and anal angle slightly emarginate and edged with black; beneath brownish ochreous; primaries with a narrow brown streak at the end of the cell, and a transverse brown band (almost divided into spots by the nervures) midway between it and the apex, extending from the costa almost to the inner margin, where it becomes narrow and of a darker brown; secondaries with a brown streak at the end of the cell, and a fine transverse white line beyond the middle, divided beyond the nervures, and edged with black on its inner side, commencing at the costa, turned inwards posteriorly, and ending just above the anal angle, which is orange-red and the lobe black. Expanse of wings 16–22 lines.
- “Allied to *T. lutea*, Hew.; but it is of a darker orange above, without the black spots on secondaries, has more elongate wings, and is very differently marked on the underside.
- “A few specimens were found by Mr. Jonas flying about a chestnut-tree near the River Yekawa, at the foot of Assama-yama.” (*Janson, l. c.*)

According to Pryer, *Z. jonasi* occurs in Yezo, and at Yokohama and Asama-yama. There were specimens in his collection labelled “Oiwake, 1885.”

I took specimens in August, flying about small trees, at Hakodate in Yesso. Oberthür states that some specimens were taken by M. l'Abbé David in the north of China, and adds:—“The Chinese examples are larger than those from Japan, but do not present any other difference.”

Standinger (*Rom. sur Léop. vi.*) records this species from various parts of Amurland.

Zephyrus melpomene. (Plate XXVIII. fig. 14, ♂.)

Dipsas melpomene, Lecch, Entomologist, xxiii. p. 41 (1890).

Pale orange-brown; apex of primaries, tail, and anal angle of secondaries black. Under surface rather browner than above; primaries streaked with whitish along the inner margin, discoidal bar and submarginal line darker, the latter faintly edged externally with whitish; secondaries with dark discoidal bar edged with whitish; submarginal line white, curved, and slightly indented before abdominal margin, followed by a paler shade of the ground-colour; a spot between second and third median nervules and one at anal angle black; the marginal border is of the ground-colour, intersected by a paler line to the second median nervule, then pale reddish orange to the abdominal margin; fringes of the ground-colour, preceded by a darker line to the second median nervule, from which point to the anal angle the fringes are white, preceded by a black line, which traverses the tail to the white tip.

Expanse 40 millim.

One example captured at Chang-yang in August.

Allied to *Z. jonasi*, Janson, but easily distinguished therefrom by the different character of the apical patch of primaries above and the markings on the under surface of secondaries; the tails are longer and more slender.

Zephyrus lutea.

Dipsas lutea, Hewitson, Ill. Diurn. Lep. p. 67, pl. xxvi. figs. 9, 10 (1865); Pryer, Rhop. Nihon. p. 13, pl. iv. fig. 4 (1886).

“*Female*. Upperside orange. Anterior wing with the outer margins brown. Posterior wing with the tail, the outer margin near it, and a spot at the anal angle dark brown. Underside orange. Anterior wing crossed by two utous bands bordered with white; a spot of brown near the anal angle. Posterior wing pale rufous brown, crossed by two lines of silvery white; a submarginal band of orange bordered inwardly by lunular white spots margined with black, and outwardly by a line of small black spots; a black spot near the base of the tail, and also at the anal angle; the outer margin brown, the fringe white. Exp. $1\frac{1}{2}$ inch.” (*Hewitson, l. c.*)

I took this species, together with *Z. jonasi*, near Hakodate in August. Pryer records it from Yokobama, Nikko, Yesso, and Asama-yama, and gives the time of its appearance as May and June.

Staudinger records *lutea* from various parts of Amurland (Rom. sur Léop. vi.), and says that the specimens do not differ from those from Japan.

Zephyrus seraphim.

Thecla seraphim, Oberthür, Bull. Soc. Ent. Fr. 1886, p. xii; Etud. d'Entom. xi. p. 19, pl. v. fig. 37 (1886).

“Appartient au groupe des *Thecla jonasi, lutea, sapestrata*. Les ailes supérieures en dessus sont du même fauve orangé que dans ces trois espèces, mais la *T. seraphim* est plus petite et d'une

contexture plus délicate. L'apex des ailes supérieures est marqué d'une tache noirâtre triangulaire. Le bord extérieur est finement liséré de noirâtre.

“ En dessous, *scraphim* diffère de *lutea* par l'absence sur le disque des ailes des lignes blanches qui distinguent *lutea*. Le milieu des ailes dans *scraphim* est d'un fauve orangé absolument uni. Le bord extérieur est seulement décoré, à peu près comme dans *lutea*, mais d'une manière moins accentuée, par une ligne blanche dont la direction est à peu près parallèle au bord extérieur; cette ligne blanche se termine en chevrons internervuraux d'autant plus aigus qu'on se rapproche davantage de l'angle anal. Entre cette ligne et le bord extérieur, il-y-a des points noirs intra-nervuraux, plus ou moins entourés ou même envahis de blanc, re-sortant sur un fond plus orangé que le fond même des ailes. La tache de l'espace nervural anté-anal est la plus noire et la plus grosse de toutes. Le bord des ailes inférieures est liséré d'une triple ligne noire, blanche et noire. L'appendice caudal ordinaire est assez long, fin et noir.” (*Oberthür, l. c., Bull. Soc. Ent. Fr.*)

The spot at anal angle is entirely absent in some examples, and in some specimens there are indications of a black spot at outer angle of secondaries.

Appears to be a common species in many parts of Western China, occurring in June and July above 10,000 feet. I have received it from Omei-shan, Ta-chien-lu, Ni-tou, Wa-shan, Che-tou, and Pu-tsu-fong.

Zephyrus minerva. (Plate XXVIII, fig. 12, ♀.)

Dipsas minerva, Lecch, Entomologist, xxiii. p. 40 (1890).

Female. Pale orange-brown; outer margin of primaries narrowly bordered with black, broader at the apex. Secondaries with a black spot on outer margin between second and third median nervules, and another at anal angle; fringes grey, darker at the tips and extremities of nervules, preceded by a black line, which traverses the tail to the white tip. Under surface rather paler than above: primaries with an interrupted white submarginal line, edged internally with black, followed by a series of white lunules, edged externally with black, and enclosing reddish-orange spots: secondaries have a white submarginal line, edged internally with black, with three deep indentations before abdominal margin, followed by an undulated black-edged white line enclosing some reddish-orange spots and two black ones: one of these last is placed at outer angle, and the other, which is edged with reddish orange, between second and third nervules: the orange spots are edged externally with black, intersected by short projections from a white line parallel with outer margin: fringes and tail as above.

EXpanse 37 millim.

In one of the specimens the border of outer margin and apex is very faintly indicated.

Allied to *Zephyrus (Thecla) scraphim*, Oberth., from which it differs principally in the arrangement of markings on under surface of secondaries.

Occurs in June at Ichang, Central China, from whence I received five female specimens. I have not seen the male of this species.

Zephyrus comes. (Plate XXVIII. fig. 9, ♀.)*Dipsas comes*, Leech, Entomologist, xxiii. p. 41 (1890).

Female. Closely allied to *D. minor*, but the black border of primaries is confined to the apical and costal areas: on the secondaries there is no black spot, but there are traces of a pale submarginal line, which is deeply indented before abdominal margin; the under surface is browner, there are no markings on the primaries beyond the submarginal line; the submarginal line of secondaries starts from a point nearer the middle of costa and has only one deep indentation before abdominal margin, the line following extends only from the outer angle to second median nervule and forms a series of arches interrupting the broad reddish-orange marginal border; there is no black spot at outer angle, and that between the second and third median nervules is smaller.

Expanse 38 millim.

Occurs at Chang-yang, Central China, in July at an elevation of 6000 feet, and also at Wa-ssu-kow, Western China. Appears to be a scarce species.

Zephyrus thespis. (Plate XXVIII. fig. 2, ♂.)*Dipsas thespis*, Leech, Entomologist, xxiii. p. 42 (1890).

Pale orange-brown; tail, anal angle, and spot between second and third median nervules black.

Under surface pale ochreous brown, with central transverse and submarginal lines of primaries white, the first bordered internally and the last externally with black; secondaries have an internally black-bordered white central line projecting sharply outwards before reaching the abdominal margin, and a submarginal series of connected black-edged white lunules, the first of which at the outer angle is followed by a black spot; another larger black spot displaces the lunule between second and third median branches; this is surrounded with reddish orange, and the marginal border is tinged with the same colour; a small black spot at anal angle, and there are some short longitudinal black dashes before the black line at base of the white fringes.

Expanse 33 millim.

One example, taken at Ichang in August.

Allied to *Zephyrus (Thecla) lutea*, Brem., but differs from that species very materially in the markings of under surface of secondaries.

Zephyrus michaelis. (Plate XXVIII. fig. 7, var.)*Thecla michaelis*, Oberthür, Etud. d'Entom. v. p. 19, pl. v. fig. 2 (1880).

Shape of *taxila*. Black on the upper surface. Both sexes have an orange patch on the disc of primaries, but this is better developed in the female than the male: this patch occupies the space between the median nervure and the inner margin. The secondaries are tailed, and the anal angle of the female has a velvety-black spot and a broad orange marginal band, which is intersected by the nervules; there is a black spot on the orange band in the first median interspace. In the male there is only a slight trace of this orange band at the anal angle.

"On the under surface the sexes only differ in the more pronounced coloration of the female. The wings are of a uniform pale orange-yellow, traversed by a band parallel with the outer margin; this band is formed of silver crescents margined with black, placed between the nervules and followed externally by orange patches, which increase in size towards the inner margin of each wing; the last of these spots on the primaries is double and replaced by black; beyond the silver crescents there is a series of white spots; there is a black spot at anal angle, and another in the first median interspace corresponding with that on upper surface. Fringes white, preceded by a black line.

"One male and two females taken in August in the Isle of Askold." (*Oberthür, l. c.*)

M. Oberthür's figure of this species, representing a female example, measures 46 millim. in expanse.

Dr. Staudinger (*Rom. sur Léop. vi. p. 146*) says that he has received this species from Sutschan, Askold, and Vladivostock.

Var. *gabrielis*, var. nov. (Plate XXVIII. fig. 7, ♀.) This form, which bears the same relation to the type that *raphaelis* does to var. *flavum*, has all the wings bright fulvous on upper surface; the apex of primaries is broadly black, extending along the costal and outer margin; the secondaries have a black patch near outer angle; there is no black spot in first median interspace. Under surface as in the type, but there is no black spot on the outer margin in first median interspace of primaries as represented in the figure of *michaelis*.

Expanse 52 millim.

One female example of this form, for the loan of which I am indebted to Mr. Grose Smith, was taken in Western China, probably at Omei-shan. My collectors failed to meet with it.

Zephyrus raphaelis. (Plate XXVIII. fig. 10, var.)

Thecla raphaelis, Oberthür, *Etud. d'Entom. v. p. 20, pl. v. fig. 1* (1880); Fixsen, *Rom. sur Léop. iii. p. 278* (1887).

Dipsas flavum, Lecch, *Proc. Zool. Soc. 1887, p. 410, pl. xxxvi. fig. 2.*

"Ailes arrondies, inférieures sans prolongement caudal, entièrement rouge orangé en dessus, sauf le bord terminal des ailes supérieures bordé de noir, ainsi que la partie antérieure du bord terminal des ailes inférieures. Cette bordure noire est un peu variable et plus ou moins prononcée suivant les individus. La partie la plus large de la partie noire se trouve à l'apex des ailes supérieures, à l'angle interne des inférieures et par un petit renflement à l'extrémité inférieure du bord terminal des premières ailes.

"Le dessin ne diffère guère de celui de *michaelis* que par sa teinte orangée plus vive.

"L'abdomen diffère de celui de *michaelis* parce qu'il est fauve en dessus au lieu d'être brun." (*Oberthür, l. c.*)

When M. Oberthür wrote the above description he had a male specimen of the species from Amurland and a female example from Askold, but he does

not mention to which of these specimens his description refers. The figure appears to represent a female.

Dr. Fixsen records two specimens from Corea.

Var. *flamen*, Lecch. (Plate XXVIII, fig. 10, ♀.) Ground-colour of all the wings dull orange, deeply bordered round the costal and outer margins with black; veins of the hind wings deeply marked with black towards the outer margin; a small black spot occurs near the outer margin of the secondaries between the first and second median nervules. Fringes short, dirty white. Under surface of all the wings yellowish buff, outer margins bordered by a narrow black line; a submarginal band of bright orange elongated spots, bordered on each side by a row of silver spots, runs round the wings, interrupted at the inner angle of the primaries by a conspicuous black double spot; there is a small black spot on primaries between the fifth orange spot and outer margin, and a row of three black spots near the anal angle of secondaries.

This form agrees with the type in being destitute of tails and in having the same design on the under surface. It is, however, much larger, and there is a larger proportion of black on the upper surface; in this latter character it resembles *Z. michaelis*.

Dr. Staudinger (Rom. sur Léop. vi. p. 146) considers *flamen* to be synonymous with *raphaelis*, Oberthür, but he does not give his reasons. I should have been disposed, however, to keep *flamen* distinct from *raphaelis*, if I had not seen *Z. michaelis*, var. *gabrielis*, from China, which stands in the same relation to the type of that species as the type of *raphaelis* does to my *flamen*.

I only succeeded in taking one specimen of var. *flamen*. It was flying over small trees near the monastery of So-ko-San, about fourteen miles west of Gensan, on June 15th, 1886. The type—i. e. *raphaelis*—is stated to fly in August.

Occurs in Amurland, Isle of Askold, and Corea.

Zephyrus ibara.

Thecla ibara, Butler, Proc. Zool. Soc. Lond. 1881, p. 852; Waterhouse, Aid Identif.

Ins. pl. cxiii. (1882); Pryer, Rhop. Nilon. p. 16, pl. iv. fig. 18 (1886).

“*Femal.* Upper surface similar to *T. nera*, sericeous fuliginous brown: primaries with broad diffused blackish external area and costal border; fringes snow-white, spotted with black at the extremities of the veins; head olivaceous, varied with snow-white. Under surface of wings golden stramineous: a discal series of black-edged orange lunate spots, followed by a series of oval pearl-white spots from the upper radial of primaries to the second median branch of secondaries, the third and fourth of the primaries bounded externally by a few black scales, the fifth (or last) on the primaries bounded by a large black spot, the orange lunule also almost wholly covered by its black border, the fifth and last of secondaries

bounded by a small black spot; a broad orange patch, in continuation of the discal spots, at anal angle, its inner edge bounded by two slender black lituræ; a large submarginal black spot on the inner half of the orange patch, which is bounded by the first median interspace and two black marginal spots in the angles of the outer half, upon interno-median interspace; these two spots are connected by a silvery-blue line; all the wings, with a black marginal line; fringes snow-white, spotted with black. Body below snow-white; legs banded with black. Expanse of wings 1 inch 9 lines.

“Ibara Pass, Dewa, 2nd week of July. Coll. M. Fenton.” (*Butler, l. c.*)

This appears to be a very rare species, and has only been observed in Japan.

The specimen from Nikko referred to by Pryer (*l. c.*) is now in my possession. It is of the same sex as the type, but differs from the figure in ‘Aid’ in its narrower wings, and in having a pale brownish shade on disc of primaries; the tails of secondaries are shorter and broader, and the under surface is not so green.

Zephyrus stygiana.

Thecla stygiana, Butl. Ann. & Mag. Nat. Hist. (5) vii. p. 35, pl. iv. fig. 6 (1881).

*Above smoky brown, without markings. Wings below greyish brown, with an indistinct externo-discal series of blackish spots bounded outwardly with yellowish; primaries with an indistinct whitish-bordered black spot at external angle; secondaries with a very indistinct submarginal series of dusky spots; a patch of orange at external angle, enclosing a black spot above the tail, which is also black; anal angle black; pectus bluish white; venter sulphur-yellow.

“Expanse of wings 1 inch 7 lines.

“Nikko, Central Japan (*Marics*).” (*Butler, l. c.*)

This seems to be a very rare species. Pryer does not refer to it in his ‘*Rhopalocera Nihonica*,’ and so far as I am aware there is but one specimen known; this is the type in the National Collection at South Kensington.

Zephyrus enthea. (Plate XXX. fig. 18, var.)

Thecla enthea, Janson, Cistula Entom. ii. p. 157 (1877); Pryer, Nihon. p. 15, pl. iv. fig. 12 (1886).

*Above dark brown, disc of primaries lighter; secondaries with one long tail, white at its apex; beneath white; primaries with seventeen conspicuous black spots, arranged thus—two near the base, the upper one large, one at the end of cell, three in an oblique row on the costal margin beyond the middle, and an irregular transverse row of five, followed by a submarginal row of six; apical margin rather broadly brown; secondaries with three spots in a row at the base, a small one in the cell, an elongate one at its end, a similar-shaped one between it and the anal angle, three along the abdominal margin, a curved transverse row of six beyond the middle, and a submarginal row of five, those at the base and near the costal margin black,

but towards the apex the wings become dusky and the spots pale brown, margined with white, anal region pale orange, with two small black spots at the base of the tail, and one at the anal angle. Expanse of wings $1\frac{1}{2}$ inch.

"Two specimens taken by Mr. Jonas, near the River Yokawa, about 140 miles N.W. of Yedo [Tokio], are all I have seen of this distinct species." (*Janson, l. c.*)

The Western-Chinese form (Plate XXX. fig. 18) differs from the Japanese in having two conspicuous white blotches on the upper surface of primaries; the fringes of all the wings are pure white, and on the secondaries are preceded by a white line towards anal angle. Similar to the type on under surface. The white blotches of the Chinese specimens are represented in the Japanese examples by ill-defined pale brownish marks, and it is probably to these marks that Janson refers in his description of *Z. enthea* when he says "disc of primaries lighter."

One specimen from Omei-shan has the usually large basal spots on under surface of primaries replaced by a small black dot; the first three spots of central series are confluent, and the orange colour on anal area of secondaries does not form a patch, but simply a dash before the black spot at anal angle and a ring round that in first median interspace.

According to Pryer this species is on the wing in July, and is abundant at Asama-yama and not uncommon at Nikko. I took some very worn specimens in Yesso at the beginning of August.

My collectors obtained specimens in Western China at Moupin and Omei-shan in June, at elevations ranging from 4000 to 8000 feet.

Christoph obtained it in Amurland, and Graeser states that he bred two fine females from some uniformly pale green larvæ which he found feeding on *Juglans mandschurica*.

Zephyrus attilia.

Thecla attilia, Bremer, Bull. Acad. Petr. iii. p. 469 (1861); Lep. Ost-Sib. p. 24, pl. ii. fig. 3 (1864); Pryer, Rhop. Nihon. p. 15, pl. iv. fig. 11 (1886).

"Alæ supra fusce ciliis albis, apicem anticarum versus fuscis; alæ posticæ caudatæ.

"Alæ subtus cœrulescenti-albæ; anticæ macula discoidali, fascia transversa, fasciis submarginalibus interruptis duabus (interiore obsoleta) lineaque ante cilia nigris.

"Alæ posticæ fascia media recta (angulum analem versus angulum acutum formante) fascia interrupta submarginali lineaque ante cilia nigris, maculis duabus anguli aui fulvis, nigro-notatis. 30 mm." (*Bremer, l. c., Lep. Ost-Sib.*)

Pryer says that this is the most abundant "*Thecla*" in the neighbourhood of Yokohama, and that it varies in the markings of both surfaces. I have

received specimens from Chang-yang, Central China. Probably this species occurs in Corea, but so far has not been recorded from that locality.

Dr. Staudinger (Rom. sur Léop. iii. p. 139) states that Dörries found the larva of *Z. attilia* on oak, and described it as green with yellow dorsal streaks.

Distribution. Amurland, Japan, Central China.

Zephyrus butleri.

Thecla butleri, Fenton, Proc. Zool. Soc. Lond. 1881, p. 853; Waterhouse, Aid Identif.

Ins. pl. cxv. fig. 1 (1882); Pryer, Rhop. Nihon. p. 16, pl. iv. fig. 13 (1886).

Thecla oberthüri, Staudinger, Rom. sur. Léop. iii. p. 138, pl. vi. figs. 4 a, b, ♀ (1887).

“Allied to *T. attilia*; colour the same; margin of primaries straighter. Above, the submarginal row of white spots in the secondaries larger and more distinct, the third, fourth, and the one near the anal angle centred with black; below, the ground-colour slightly duskier, becoming still more so towards the margin; in the primaries is a transverse bar in the middle of the cell, extending from the subcostal to the submedian vein, and almost divided by the median into two spots; the discal bar ceases abruptly at the third median veinlet; an extra small spot, just on the division between the middle and apical thirds, between the third median veinlet and the submedian vein: secondaries with a transverse row of three black spots at the base in a descending series from the costal vein, a short bar at the end of the cell as in primaries; a transverse irregular bar in the middle third, extending from the costal and narrowing towards the independent vein; a row of three oblong spots, the first two with the longer axis placed transversely, the third near the inner edge, almost at right angles to the second; a submarginal row of whitish spots centred with black, more distinct and enclosed in the aforesaid dusky colour; the orange-red at the base of the tail and at the anal angle more suffused. Expanse of wings 1 inch $3\frac{1}{2}$ lines.

“One specimen taken about the middle of August on the top of the peak, 1060 feet high, overlooking Hakodate.” (Fenton, *l. c.*)

This appears to be a rare insect in Japan; there was but one specimen in the collection of the late Mr. Henry Pryer; this is from Yesso and is probably the example referred to by him in his book. Dr. Staudinger describes the species under the name of *T. oberthüri*, and states that it was found on the Ussuri by Dörries, who also obtained it at Askold and Suifun in small numbers.

Zephyrus orsedice.

Thecla orsedice, Butler, Proc. Zool. Soc. Lond. 1881, p. 852; Pryer, Rhop. Nihon.

p. 15, pl. iv. fig. 17, ♂ (1886); Waterhouse, Aid Identif. Ins. pl. cvii. ♀ (1882).

“♀. Upper surface much like the females of *Iolus pseudolonginus* and *Pithecops intensa*. Primaries pale bluish grey or greyish white, with very broad black-brown apical area and

external border; median branches blackish; costal border pale bronzy brown, faintly shot with violet; fringe tipped with white; secondaries fuliginous brown, with the abdominal area and discoidal cell washed with pale ash-grey; a slender snow-white submarginal line; fringe tipped with white; head somewhat olivaceous; body greyish; abdomen sordid brownish. Wings below pale shining dove-brown, with white submarginal line, white-tipped fringe; a disco-submarginal series of white-edged black spots and an irregular white-edged black discal line; primaries with the discal line straight from the third subcostal to the first median branch, where it is interrupted; the disco-submarginal spots subconical, almost orbicular, increasing in size from the costa to the external angle; internal border white; secondaries with the discal line near to the middle of the wing, oblique and terminating in a **W**-shaped character; the disco-submarginal spots lunate, the sixth interrupted by a large orange spot with black centre, and the seventh divided by an orange-and-black trifid streak which extends to the anal angle; body below white. Expanse of wings 1 inch 6 lines.

"Iwashiro [Yesso], second week in July. Coll. M. Fenton.

"Allied to *T. cretaria* of Hewitson." (*Butler, l. c.*)

The male, which appears not to have been previously described, but is figured by Pryer, *l. c.* is of a uniform silky white, with a faint opalescent tinge, and a narrow black outer marginal line on all the wings, increasing in width towards apex of primaries. Under surface as in the female.

Pryer states that he met with this species at Nikko and Ontaki-san in July. I took a female specimen myself at Tsuruga, on the west coast of Central Japan, in July, and the male described above was taken in the Isle of Yesso. Appears to be a very scarce species.

Genus SINTHUSA.

Sinthusa, Moore, Journ. Asiatic Soc. Beng. liii. pt. 2, p. 33 (1884); Distant, Rhop. Malay. p. 461 (1886); de Nicéville, Butt. Ind. iii, p. 483 (1890).

"**MALE.** *Fore wing* small, somewhat broad; costa arched at the base, apex pointed, exterior margin slightly oblique and convex, posterior margin convex near the base; subcostal nervure five-branched, first subcostal nervule emitted at nearly one half, second at one fourth, and third from near the end of the cell, third bifid near its end; discoidal cell extending to half length of the wing; discocellular nervule slender; discoidal nervule from its middle; first median nervule at more than one third, and second median from near the end of the cell; submedian nervure straight.

"*Hind wing* small, short, broad, costa arched in the middle, exterior margin with a single slender tail from the end of the first median nervule; discoidal cell broad, triangular, extending half the wing; first subcostal nervule at one half before the end of the cell; discocellular nervule oblique, slender; discoidal nervule from its middle; first median nervule at nearly one half, and second median from near the end of the cell; submedian and internal nervures recurved.

"Palpi porrect, second joint long; third joint short, slender, pointed.

"Antennæ with a large thick-pointed club.

"Type *S. nasaka*, Horsfield." (Moore, l. c.)

Sinthusa chandrana.

Hypolycæna chandrana, Moore, Proc. Zool. Soc. Lond. 1882, p. 249, pl. xi. figs. 2, 2 a, ♂; de Nicéville, Journ. Asiat. Soc. Beng. lii. pt. 2, p. 78, pl. ix. fig. 1, ♀ (1883).

Sinthusa chandrana, de Nicéville, Butt. Ind. iii. p. 486 (1890).

Thecla pratti, Leech, Trans. Ent. Soc. Lond. 1889, p. 110, pl. vii. fig. 4.

"Allied to *H. nasaka*. Male. Upperside violet-brown; fore wing with the lower basal and discal area dull violet-blue, and the medial area of hind wing purplish violet-blue; marginal line and anal lobe black. Cilia whitish. Underside olive-grey; fore wing with a broad discocellular slender black-lined white-bordered streak, a similar broken discal band, and a similar marginal narrower lunular band; hind wing with a similar discocellular streak, a discal band, which is broken beyond the cell and bent upwards above anal angle, and a marginal dentated band ending in a large red spot and anal lobe and an intervening streak, the spot and anal lobe black-centred, the streak with metallic-green borders; a white-bordered black spot on costa near the base, another at end of the cell, and a less distinct spot above anal angle.

"Expanse $1\frac{1}{2}$ inch." (Moore, l. c.)

Thecla pratti, Leech.—Male. Primaries black, with violet reflections over the discal area. Secondaries black, with the exception of a violet suffusion, bounded by two imaginary lines drawn from the base of wing, and terminating respectively at the anal angle and the extremity of the first subcostal nervule. Tails black tipped with white; anal lunule red. Fringes of all the wings pale, but becoming darker towards the apex of primaries.

Female. Uniformly smoky black. Anal lunule reddish orange, bordered on its inner margin by a few bluish scales. Fringes of all the wings white, merging into black at the apex of primaries.

Underside: all the wings whitish grey. Primaries with a short darker transverse bar at the end of discal cell, beyond which is a darker broken band running from the costa towards the inner margin. Secondaries with two small dark spots near the base of wing, and a short darkish discal bar; beyond this is an irregular arrangement of darkish markings. Above the tail is a small black spot surrounded with yellow, a slender streak of which colour runs parallel with the hind margin to the black anal lunule, and then, turning at a right angle, traverses a third of the abdominal fold.

Expanse 32 millim.

This species is variable on the underside both in shade of colour and in the intensity of the markings. In these respects four of the six specimens I received from Kiukiang differ somewhat from the examples described above. The anal lunule on upper surface of secondaries is also subject to variation, as in one example it is pale yellow, and in another bluish.

I took a few specimens of this insect at Foochau in April, 1886.

Mr. de Nicéville says: "I find that *S. chandrana* is one of the most variable of the Lycenidæ. In the Western Himalayas, from whence I have the fewest specimens, it appears to be fairly constant, the catenulated bands of the underside narrow and clearly defined. It is in Sikkim and Assam that the species varies so much. Here typical *chandrana* is occasionally met with, but the more common form has the bands of the underside much broader, often more or less confluent, very prominent, and the ground-colour much darker. The females show extraordinary variability on the upperside. Some specimens are entirely glossy fuliginous black, with some obscure irrorated white patches between the veins near the outer margin of the hind wing; others have a small whitish-ochreous patch on the fore wing, with the white on the hind wing more developed; others have a large whitish-ochreous patch on the fore wing, the outer half of the hind wing also white; lastly Mr. Möller possessed a very aberrant Sikkim specimen in which there is a bright ochreous somewhat large oval patch on the disc of the fore wing, the hind wing unmarked."

Distribution. Central China, Foochau, Upper Burma, Assam, Himalayas.

Genus CHRYSOPHANUS.

Chrysophanus, Hübner, Verz. bck. Schmett. p. 72 (1816); Westwood, Gen. Diurn.

Lep. ii. p. 497 (1852); de Nicéville, Butt. Ind. iii. p. 313 (1890).

Polyommatus, Boisduval, Gen. et Ind. Meth. p. 9 (1840).

Lycæna, sect. 3 (part.), Fabricius, Ill. Mag. vi. p. 285 (1807).

Heodes (part.), Dalman, Kongl. Vetensk. Acad. Hand. xxxvii. p. 63 (1816).

"General characters of *Lycæna*, but with the eyes naked, and the upperside of the wings generally copper-coloured.

"HEAD small, hairy.

"*Labial palpi* obliquely pectinated, of moderate length; the basal and middle joints thickly clothed with bristly hairs: terminal joint slender, elongate, nearly naked, of nearly equal length in both sexes.

"*Antenna* of moderate length, slender: middle joints long, ringed with white; terminated by a distinct elongate-ovate club, not or scarcely spoon-shaped.

"*Fore wings* somewhat elongated, and more acute at the tip than in *Lycæna*, with the veins and their branches arranged as in that genus; the position of the slender discocellular veins closing the discoidal cell indicated by a transverse black spot on the underside, which is generally much ocellated.

"*Hind wings* ovate, with the anal angle more prominent than in *Lycæna*; the extremity of the first branch of the median vein is also often produced into a slight angle, especially in the males; marked beneath with black spots similar to those of the fore wings.

- “*Fore legs* nearly alike in size in both sexes, scaly. The tibiae armed with numerous short acute spines, set on irregularly, the tip not produced into a hook. The underside of the tarsi also armed with still more numerous spines; those of the male exarticulate, and terminating in an obliquely curved horny point; those of the joint armed with acute ungues, rather dilated and angulated near the base. Pseudonychia moderate-sized, strongly bifid, the divisions conical, finely setose. Pulvillus large.
- “*Four hind legs* rather short. Basal joint of the tarsi long, and often swollen in the males. Ungues and their appendages formed as in the fore legs.
- “*LARVA* elongate-ovate, swollen, onisciform, generally finely hairy, head small; feeding upon docks, grasses, and low herbage. *Pupa* short, thick, and entire, with the head-case obtuse.” (Westwood, l. c.)

Chrysophanus dispar. (Plate XXVIII. figs. 4, 6, var.)

Papilio dispar, Haworth, Lep. Brit. p. 40 (1803).

Polyommatus dispar, Lang, Butt. Eur. p. 90, pl. xix. fig. 4, ♂ ♀ (1884).

Papilio rutilus, Wernburg, Beitr. Schmett. i. p. 391 (1864).

Polyommatus dispar, var. *rutilus*, Lang, Butt. Eur. p. 91, pl. xx. fig. 1, ♂ ♀ (1884);

Fixsen, Rom. sur Léop. iii. p. 283 (1887).

Polyommatus auratus, Leech, Proc. Zool. Soc. Lond. 1887, p. 114, pl. xxxv. fig. 3, ♂ ♀.

Polyommatus dispar, var. *dahurica*, Graeser, Berl. ent. Zeit. 1888, p. 75.

- “Expands 1·62 to 2 inches. The male is brilliant coppery-red; all the wings have a narrow black hind marginal border. The fore wings have two spots in the discoidal cell, the outer one being elongated, and the inner one being merely a black dot; about midway between the outer spot and the hind margin, and parallel to the latter, is an indistinct row of dark spots; the hind wings possess a similar row, and also an elongated discoidal spot. The female is larger than the male; the fore wings have a broader hind marginal band, and parallel to this a row of seven large black spots; there are three spots in the discoidal cell. The hind wings are copper, with three rows of black spots, generally clouded over with dusky brown, except along the hind margin, which has a broad copper band; sometimes the hind wings are rather broadly veined with copper. The underside is similar in both sexes. The fore wings are bright orange-red, with a grey hind marginal border. In the discoidal cell there are three black spots, surrounded by grey rings, and parallel to the hind margin is a row of spots similar to those just mentioned, and seven in number. The hind wings are pale grey, strongly tinged with light blue towards the base, and with a broad and very distinct hind marginal orange border enclosing a double row of black spots; at the base are two black spots, and one near the centre of the costa; there are three spots, two small and round, and one elongated, in the discoidal cell, and then one midway between the latter and the inner margin; beside these, there is an irregular row of ten large spots running parallel to the hind margin, and these, as well as all the other spots, are surrounded by light rings.” (Lam., l. c.)

- Var. **rutilus**, Wernberg. “This is smaller and less brightly coloured than the type, the spots on the underside are much smaller, and the colour of the underside is ashy grey, with very little tinge of blue. The most distinctive feature, however, is the narrowness of the orange band on the underside of the hind wings, near the hind margin. I have examined a great number

of specimens of *cutibus*, and also of *dispar*, with the object of fixing upon some constant character by which they may be differentiated, and have never seen a specimen of *rutilus* with the hind marginal band so broad and so well defined as it always appears in *dispar*." (*Lang, l. c.*)

Var. **auratus**, Lecch. (Plate XXVIII, fig. 4 ♀, 6 ♂.) *Male*. Upper surface of the wings bright golden copper, with narrow black outer margins; fringes black except on the inner margin of secondaries; six black spots on outer margin of secondaries, the two nearest the anal angle being nearer together than the others. *Female*. Primaries golden copper, much suffused with darker scales, margined broadly on the outer border with black; two black discoidal spots, followed by a band of broad black dashes extending across the wing; secondaries sooty black, bordered by a broad golden-copper band notched at the edges. Under surface of both sexes: primaries yellowish buff, bordered on the outer margin with dirty grey, inside of which is a row of seven very distinct black spots; on the disc is a second irregular row of black spots; there are three spots on the discoidal cell, the outer one of which is the largest; secondaries greyish buff, outwardly margined by a broad orange band, bordered on each side with a row of black dots; an irregular arrangement of black spots, margined with dirty white, is scattered over the remainder of the wing.

Similar in markings to *Chrysophanus dispar*, Haw., but its colour resembles that of *C. ochinus*, H.-S.; the fringes are blackish, the discal spots are absent on all the wings of the male, the female has a row of dashes on the primaries instead of spots, and the disc of hind wings is not suffused with copper: the under surface of secondaries is browner, and the central series of spots more evenly curved.

I took this form, during heavy rain, at rest on stems of coarse grass in a swampy gully near the monastery of Chang-do, about twenty-five miles south of Gensan in the Corea. Alphéraky (Rom. sur Lép. v. p. 103) states that a specimen of this variety was taken in June, 1886, by Potanine near Hè-Tchèn, in the Province of Kan-sou. He also remarks that the specimens of *C. dispar* recorded by Fixsen from Corea as var. *rutilus* are really referable to var. *auratus*. Staudinger (Rom. sur Lép. vi. p. 154) considers that var. *dahurica*, Graeser, is identical with my var. *auratus*. It would appear, therefore, that *C. dispar* is represented in Eastern Asia by the *auratus* form only, and I think that the specimens recorded as *P. hippothoë* by Bremer* and Grey (Lep. Nörd. China, p. 10) are probably referable to this form of *dispar*.

Dr. Lang (*l. c.*) describes the larva of *dispar* as green with a darker dorsal stripe, and gives the great water-dock (*Rumex hydrolapathum*) as the food-plant. He adds: "the eggs were laid in August, the larva hibernating and

* According to Elwes (P. Z. S. 1881, p. 887), Bremer records *Chrysophanus virgaureæ* from Peking: but I am unable to find the work in which this record is published.

becoming full-fed in the June following." The larva of *rutilus* is described as green with a paler lateral stripe, and is stated to feed on various species of *Rumex* and on *Polygonum bistorta*.

The typical form of this species was at one time common in the fenlands of England, but has not been seen in that country since about the year 1848. On the continent of Europe, *C. dispar* is represented by the form *rutilus*, which occurs in France, Germany, and the South-east. This form is also found in Asia Minor, Armenia, and the Altai.

Chrysophanus phlæas.

Papilio phlæas, Linnaeus, Faun. Succ. p. 285 (1761).

Polygonumatus phlæas, Godart, Enc. Méth. ix. p. 670 (1823); Lang, Butt. Eur. p. 95, pl. xxi. fig. 4 (1881); Pryer, Rhop. Nihon. p. 16, pl. iv. fig. 21, ♀ (1888).

Chrysophanus phlæas, Westwood, Gen. Diurn. Lep. ii. p. 498 (1852); de Nicéville, Butt. Ind. iii. p. 315, pl. xxvii. fig. 205, ♂ (1890).

Papilio timeus, Cramer, Pap. Exot. ii. p. 137, pl. clxxxvi. figs. E, F, ♀ (1777).

Chrysophanus stygianus, Butler, Proc. Zool. Soc. Lond. 1880, p. 408, pl. xxxix. fig. 5, ♂.

Hesperia cleus, Fabricius, Ent. Syst. Suppl. p. 430 (1798).

Chrysophanus phlæas, var. *chinensis*, Felder, Verh. zool.-bot. Ges. Wien, xii. p. 488 (1862).

"*Male*. Upperside: fore wing dark sluing copper overlaid with blackish scales, with a somewhat broad even black band on the outer margin; a small black spot near the base of the discoidal cell, a quadrate one in the middle, and an oblong one at its end; a discal series of seven rounded spots placed in echelon, the three upper ones from the subcostal nervure to the third median nervule, the next two in the median interspaces, the last two (usually more or less conjoined) in the submedian interspace. Hind wing blackish; the discocellular nervules marked with a linear deep black spot; a broad coppery submarginal band from the anal angle to the middle of the second subcostal interspace, inwardly marked with a series of cordiform black spots placed against the band, sometimes with a discal series of blue irrorated spots, generally four in number; the outer edge of the orange band deeply scalloped. Underside: fore wing bright ochreous, the apex broadly, outer and inner margins less broadly, brownish grey; the black spots as above, but surrounded by a pale ochreous line; the inner edge posteriorly of the outer marginal band with three increasing black spots placed against it. Hind wing brownish grey, with a few indistinct darker spots scattered evenly over the surface; with the coppery band of the upperside, but much narrower and obscure. Cilia cinereous on the upperside, brownish grey on the underside.

"*Female*. Upperside: fore wing with the copper coloration brighter and clearer than in the male, the black spots smaller and better defined. Hind wing with the coppery band broader. Underside: fore wing with four, instead of three, black spots placed against the outer brownish-grey marginal band. Hind wing like the male." (*de Nicéville, l. c.*)

Expanse, ♂ ♀, 1.2-1.6 inch.

Larva. "The colour of the head dingy green, with a few dark brown markings; of the body, opaque apple-green, the warts being white and the bristles sienna-brown; in some specimens the green is interrupted by three stripes of a delicate purplish pink, one of them medio-dorsal, the others marginal."

The foregoing description of the larva is that given by Newman in his 'British Butterflies,' and is quoted by Dr. Lang (*l. c.*). A more extended life-history of the species will be found in Buckler's 'Larvæ of British Butterflies and Moths,' i. pp. 91-94, where *Rumex acetocella* is mentioned as a food-plant, but Dr. Lang states that the larva feeds on various species of *Rumex*.

Var. **chinensis**, Felder. Differs from typical specimens in its larger size, much broader spots of the primaries, narrower marginal band on upper surface of secondaries, and larger and more distinct spots on the under surface. The type, a female, was from Shanghai.

I met with this form in the Snowy Valley at Ningpo. The specimens are much larger than any others in my collection.

Var. **timeus**, Cramer. "*Male.* Larger than the typical form. Upperside: fore wing very much darker, the coppery colour almost entirely overlaid with blackish; the black spots larger. Otherwise as in the typical form. *Female.* Larger. Upper surface: fore wing with the lower basal area thickly overlaid with blackish scales, having the apical and other portions alone of the coppery ground-colour quite clear. Hind wing with the discal blue spots often very large and prominent. Otherwise as in the typical form." (*de Nicéville, l. c.*)

Var. **stygianus**, Butler. "*Male.* Smoky brown; primaries in certain lights shot with fiery copper; spotted with black as in *C. timeus (eleus?* Fabr.): two small orange spots beyond the interrupted black discal series; secondaries with a slender undulated deep reddish-orange band on a black ground near the outer margin; above it a series of four or five pale blue hastate spots, and above these again beyond the end of the cell two black dots: a black dash at the end of the cell. Fringe greyish white. Body blackish. Wings below very like *C. timeus*, but considerably paler, the submarginal black spots of primaries less distinctly white-bordered: the apex and outer margin of primaries and the ground-colour of the secondaries very pale grey. *Female.* Larger than the male, the primaries with the outer third of the cell and the subapical area bright orange, the black spots larger, otherwise similar: below slightly yellowish in tint all over, so that the ground tint of the secondaries has a pale brownish rather than greyish hue. Expanse, ♂ 1 inch 4 lines, ♀ 1 inch 5 lines.

"Candahar. Common in April and May, abundant in June." (*Butler, l. c.*)

Timeus, Cramer, and *stygianus*, Butler, are both referable to the form of *C. phleas* known in Europe as var. *eleus*, Fabricius.

In his remarks on this species in Japan, Pryer (*l. c.*) states that it "varies greatly in size and coloration according to the time of year that it emerges in the perfect state; early spring forms are small and brightly coloured, often

with a row of blue spots on the back [outer] margin of the hind wing, but as the temperature increases they become larger and darker until they reach a size nearly twice that of English specimens. During the hot months the males are often *quite* black, and this continues until the last brood in November; a difference of twenty miles is, however, sufficient to account for small light-colour males appearing in one locality, and black males in another. Some years ago, in November, I collected the small light-colour males in the neighbourhood of Yokohama, and the next day took black males in Boshu, not more than twenty miles from Yokohama, but by working from Boshu towards the north, through Kadzusa, I found the dark form to be less abundant, until at Kanosan they were entirely replaced by the pale form."

Common throughout Japan and Corea. In China I met with the large bright form, var. *chinensis*, Feld., at Ningpo, and received the same form from Kiukiang, together with the dark (*eleus*) form. My collectors did not meet with *C. phlaas* in any part of Western China.

Distribution. Greater part of the Palearctic and Nearctic Regions.

Chrysophanus ouang.

Chrysophanus ouang, Oberthür, Etud. d'Entom. xv. p. 17, pl. ii. fig. 19 (1891).

- "Ailes violatre-bronzé en dessus, avec le bord marginal noirâtre, éclairci près du bord inférieur des supérieures par deux taches fauve-orangé juxtaposées, et à partir du bord anal des inférieures par un liséré lilas, surmonté de croissants intranervuraux fauve-orangé que surmontent eux-mêmes des chevrons lilas. La cellule des supérieures est clôturée par une tache noire, au delà de laquelle une ligne ondulée noirâtre descend du bord costal vers le bord inférieur.
- "Le dessous des supérieures est orangé bronzé et le dessous des inférieures brun bronzé, avec des taches et lignes blanc d'argent comme suit : aux supérieures trois points ronds avant la clôture de la cellule, ponctués de noir; un trait cellulaire épais, divisé au milieu par une ligne noire peu apparente; une rangée de taches intranervurales, extracellulaires, descendant du bord costal vers le bord inférieur, extérieurement ponctués de noir; une ligne assez épaisse, parallèle au bord marginal, lisérée très finement de noir des deux côtés; aux inférieures, cinq points basilaire ayant un reflet un peu blenatre, papillés de noir; une ligne assez épaisse en forme de **V**, ayant intérieurement un trait noir, court, près de la côte, extérieurement un point noir infra-cellulaire et un liséré noirâtre qui l'accompagne jusqu'à l'endroit où elle finit près du bord anal; une autre ligne extérieurement bordée de quatre traits noirs, formant presque un trait continu: cette ligne forme avec la première en **V**, un deuxième **V** plus court, finissant au point noir infra-cellulaire précité.
- "Enfin une ligne épaisse, allant du bord costal au bord marginal, extérieurement très dentelée, surmontant les points noirs de l'espace anal et super-caudal qui est orangé, termine, avec le liséré submarginal, la série de ces lignes ou traits blanc argenté. Le bord des ailes est finement liséré de noir; la frange est blanche. Les antennes sont amielées de noir et blanc."
(*Oberthür, l. c.*)

This species was discovered at Tse-kou by M. Dubernard, but it is probably very local, as my collectors failed to meet with it in any part of China that they visited.

Chrysophanus li.

Chrysophanus li, Oberthür, Bull. Soc. Ent. Fr. 1886, p. xxii; Etud. d'Entom. xi. p. 19, pl. v. fig. 31 ♂, 38 ♀ (1886).

- “ En dessus le fond des ailes des ♂ est violet, légèrement purpurin et brillant; les supérieures portent un point noir à l'extrémité de la cellule: elles sont bordées de noir, et un trait orangé éclaire cette bordure noire près de l'angle interne. Le bord des inférieures est orné d'une bordure noire plus large qu'aux supérieures, et dans laquelle une liture fauve-orangé découpe 3 demi-lunes noires dans les 3 avant-derniers espaces intra-nervuraux. Le dernier espace est tout entier absorbé par cette liture fauve, et elle se prolonge en outre en une saillie caudale assez longue et aiguë.
- “ En dessous les ailes supérieures sont jaune d'or orangé vif et les inférieures sont rouge-brûlé; mais dans certains individus ces teintes sont plus ou moins rembrunies et comme cuivrées. Les supérieures sont décorées d'une bande blanche submarginale, un peu courbe, lisérée de noir des deux côtés. Cette bande se prolonge sous les inférieures: mais, elle y est droite et forme une sorte de V avec une autre bande blanche un peu fulgurée venant rencontrer la première près de l'angle anal. Dans ce V, est inserit un second V par une série assez droite et oblique de 4 à 5 taches noires lisérées extérieurement de blanc, descendant du bord antérieur et joignant la première bande blanche à peu près à la moitié de son parcours.
- “ Les supérieures sont en outre ornées de points noirs nombreux, dont 3 intra-cellulaires, une bande maculaire extra-cellulaire traversant les ailes du bord antérieur au bord inférieur, presque droite, sauf pour le quatrième point noir qui sort extérieurement du rang. Les inférieures présentent aussi le long du bord anal des points noirs cerclés de blanc et de forme diverse produisant presque un troisième V avec un des côtés de plus grand.
- “ Il y a deux formes dans cette espèce, sans doute une de printemps plus petite, plus pâle, ayant les taches noires moins accentuées et l'autre estivale, plus robuste et plus chaude de ton.
- “ Les ♀ diffèrent des ♂ par la présence d'une éclaircie fauve dans les ailes supérieures, comme cela se remarque dans les autres espèces de genre *Chrysophanus*. Les taches noires du dessus disparaissent dans cette éclaircie fauve de la ♀ et la divisent.
- “ De plus, dans quelques ♀, les dessins blancs du dessous disparaissent en dessus où ils sont indiqués en violet brillant ressortant sur un fond mat noirâtre.” (*Oberthür, Bull. Soc. Ent. Fr.*)

As pointed out by M. Oberthür, there are apparently two generations of this species—the spring form as figured in the ‘Études,’ and a summer form in which the black spots and white markings of the under surface are more pronounced.

My collectors met with both forms of this species very commonly at Ta-chien-lu, Wa-sso-kow, Ni-tou, and Chow-pin-sa, up to an elevation of 10,000 feet.

Chrysophanus tseng. (Plate XXX. fig. 17, ♀.)

Chrysophanus tseng, Oberthür, Bull. Soc. Ent. Fr. 1886, p. xiii; Etud. d'Entom. xi. p. 19, pl. v. fig. 35 (1886).

“Curieux *Polygonante* intermédiaire entre *pang* et *li*; violet en dessus comme ces deux espèces, différant à peine de *li* en dessus, sauf par ce que l'appendice caudal est obtus, mais en dessous tout à fait distinct. Les ailes sont, en dessous, d'un fauve doré un peu rougâtre, traversées par trois bandes maculaires communes, extra-cellulaires, descendant du bord antérieur des supérieures au bord anal des inférieures; les deux premières sont formées de points noirs assez gros aux supérieures, nettement séparés, éclairés intérieurement d'un trait bleu violet brillant, plus fins aux inférieures, presque joints, intérieurement ornés d'un croissant blanc. La 3^e, marginale, est plus accentuée aux inférieures et à peine sensible aux supérieures. Il y a, en outre, aux supérieures deux points noirs, intra-cellulaires, entourés de violet brillant, et, aux inférieures, trois points alignés dans l'espace basilaire, du bord antérieur au bord anal. De plus, la cellule est close par un trait noir fin, en forme d'accolade lisérée de blanc. L'abdomen est gris blanchâtre en dessous. Kony-Tchéon.” (*Oberthür, Bull. Soc. Ent. Fr.*)

I have received this species from Ta-chien-lu, Pu-tsu-fong, Ni-ton, and Chow-pin-sa. The female, which M. Oberthür does not refer to, differs from the male in having a fulvous patch beyond cell of primaries; the spots of under surface are reproduced on these wings and edged internally with brilliant purple; there is a submarginal band of lunular fulvous spots edged internally with brilliant purple on the secondaries, and some dots of the latter colour on the disc.

Although widely distributed, this does not seem to be common anywhere.

Chrysophanus pang.

Chrysophanus pang, Oberthür, Bull. Soc. Ent. Fr. 1886, p. xii; Etud. d'Entom. xi. p. 19, pl. v. fig. 36 (1886).

“Les ailes supérieures sont d'un fauve orangé vif, avec les taches noires à peu près comme chez *C. hella*, mais ornées d'une liture latérale ou enveloppante d'un bleu violet brillant; les ailes inférieures sont d'un brun rouge foncé transversées du bord antérieur au bord anal par une bande extra-cellulaire, étroite, d'un blanc pur, et maculées de quelques points noirâtres qui sont peu apparents sur le fond des ailes, à l'exception toutefois de trois ou quatre finement cercelés de blanc. Les nervures sont érites en grisâtre. Elles forment entre la bande blanche transversale et le bord extérieur une série de créneaux, marqués d'une tache triangulaire intra-nervurale assise sur le liséré rouge qui borde les ailes. Le dessous de l'abdomen est blanchâtre comme dans *L. hella*.” (*Oberthür, Bull. Soc. Ent. Fr.*)

Fairly plentiful in the neighbourhood of Ta-chien-lu and Wa-ssu-kow, occurring at high elevations. The female is much scarcer than the male, and differs from that sex in having fulvous markings on the disc of primaries.

Chrysophanus standfussi. (Plate XXX. fig. 19, ♂.)

Polyommatus standfussi, Grun-Grshimailo, Horae Ross. 1891, p. 450.

"Supra alis ♂ brunnescenti-fuscis, lilacino refulgentibus, albo ciliatis, nervis rubescentibus; limbo externo, serie macularum antelimbaliū, fere fasciam formantium, punctis centrali et cellulari anticarum et discocellulari posticarum nigris.

"Alae ♀ differunt parte apicali disci aurantiaca.

"Subtus alis cinereis, disco anticarum ♀ aurantiaco; maculis anticarum nigris, posticarum fusciscentibus.

"Exp. ♂ ♀ 12-13 millim. [24-26 millim.].

"In montibus ad Sinia, in regione Amdo dicta, detectus." (*Gr.-Gr. l. c.*)

Male. Primaries brown tinged with purple; neurination and discoidal cell fulvous; the black spot about the centre, and another almost quadrate at the end of the cell; beyond there is a transverse series of black spots placed in pairs; outer margin broadly black. Secondaries blackish, slightly tinged with purple in places towards outer margin; a black bar closing the cell is followed by an indistinct series of black spots. Under surface cinereous, disc of primaries suffused with fulvous brown, spotted as on upper surface, but with an additional spot towards base of the wing; secondaries with a discal bar preceded by some spots on the basal area and followed by an irregular transverse macular band, all brownish, as also is the indistinct submarginal band.

Female. Similar to the male, but the primaries are bright fulvous.

Chinese specimens of *C. (P.) standfussi* do not differ from examples of the species kindly sent to me by M. Grun-Grshimailo, except that they are larger, and the spots on under surface of secondaries are less distinct. My native collectors met with this insect in some numbers on the high plateau beyond Ta-chien-lu.

Genus HERDA.

Herda, Doubleday, List Lep. B. M. ii. p. 25 (1847); Hewitson, Ill. Diurn. Lep. p. 5 (1865); de Nicéville, Butt. Ind. iii. p. 322 (1890).

"*Fore wing*: triangular, costa gently curved, male with the apex acute (much rounded in *I. scua*, Kollar), outer margin nearly straight or somewhat convex (much rounded in *I. scua*), inner margin straight; in the female the apex is more rounded than in the male, and the outer margin is very convex; costal nerve terminating about opposite to the apex of the discoidal cell; first subcostal nerve well removed from the costal nerve, originating at about two thirds of the length of the discoidal cell from its base; second subcostal with its base nearer to that of the upper discoidal than to that of the first subcostal; third subcostal somewhat long, given off about midway between the apex of the cell and of the wing; upper discoidal nerve originating exactly at the point where the middle discocellular nerve is given off; middle and lower discocellular nervules nearly straight and nearly upright, the lower rather longer than the middle; second median nerve given off a short distance before the lower end of the cell; submedian nerve straight.

"*Hind wing*: somewhat lengthened, usually furnished with a moderate-sized tail at the termination of the first median nerve; the tail, however, is reduced to a mere tooth in some

species: outer margin somewhat varying in outline: in some species it is scalloped, in others oblique from the apex to the termination of the second subcostal nervule, thence to first median nervule straight, in others, again, it is evenly rounded throughout; costal nervule much arched at the base, terminating at the apex of the wing; first subcostal nervule given off some little distance before the apex of the cell; disocoellular nervules straight and somewhat outwardly oblique, the upper a little shorter than the lower; second median nervule given off a little before the lower end of the cell; submedian nervule straight; internal nervule recurved. Male with no secondary sexual characters.

"Type, *I. epicles*, Godart." (*de Nicéville, l. c.*)

Ilerda viridipunctata. (Plate XXX. fig. 3, ♂.)

Ilerda tamu, Hewitson (nec Kollar), Ill. Diurn. Lep. p. 57 (1865); Moore, Proc. Zool. Soc. Lond. 1882, p. 248.

Ilerda viridipunctata, de Nicéville, Butt. Ind. iii. p. 329, pl. xviii. fig. 207, ♂ (1890).

"Allied to *I. androcles*, Doubleday and Hewitson. *Male*. Upperside blackish brown; with the medial, basal, and discal area of the fore wing and medial area of hind wing sparsely covered with dull metallic greenish-blue scales, these scarcely appearing below the submedian vein on the fore wing, and being less thickly disposed on the hind wing; anal red lamules narrow and distinct. *Female* paler brown; fore wing with an oblique discal slightly curved short red band; hind wing with a marginal narrow sinuous red band. Underside dull saffron-yellow; markings similar to those of *I. androcles*.

"Expanse $1\frac{1}{10}$ inch." (*Moore, l. c.*)

Mr. de Nicéville (*l. c.*), who states that this insect had only been met with in Sikkim and Kumaon, remarks:—"The only characters I can give to distinguish the females of *I. viridipunctata* and *I. brahama*, Moore, are that the former is a larger insect, with the ground-colour of the underside darker and of a greenish tinge. In Sikkim, however, the two species do not usually occur together, *I. viridipunctata* being found at much higher elevations than *I. brahama* ever attains. Mr. Otto Möller possesses two curious aberrations or 'sports' (or perhaps hybrids) of the male of this species, which are in some lights almost as rich a bronzy colour as obtains in *I. brahama*, only of a more greenish brassy shade. They were taken in Sikkim with *I. viridipunctata*, so I note them under that species, though they are exactly intermediate between the two."

Chinese specimens of the male have less greenish powdering on the fore wing, and in one specimen this colour is reduced to a few scales bordering the nervures. The example figured is the best-marked specimen of this species that I have received from China. Females are identical with Indian examples of this sex.

In Western China this species occurs not uncommonly at Ta-chien-lu, Wa-shan, Wa-ssu-kow, and Pu-tsu-fong.

Ilerda brahama.

Ilerda brahama, Moore, Horsfield & Moore, Cat. Lep. Mus. E. I. C. i. p. 29. pl. 1 a. fig. 4, ♂ (1857); Staudinger, Exot. Schmett. p. 274, pl. xcv. ♂ (1888); de Nicéville, Butt. Ind. iii. p. 330 (1890).

"Differs from the two preceding species [*I. tana*, Koll., and *I. androcles*, Doubl. & Hew.] in having the patches of the wings glittering coppery-gold colour, and a broader and longer exterior red band on the hind wings." (*Moore, l. c.*)

"*Female*. Upperside differs only from that sex of *I. epicles*, Godart, in the orange patch on the fore wing and the lunulated fascia on the hind wing being rather paler or more yellow in shade. On the underside it may at once be known by the absence of the marginal reddish-orange band on the fore wing, and by the presence of a discal continuous dark line across both wings, in *I. epicles* there is occasionally a discal series of disconnected short black lines forming a fascia; the ground-colour of both wings, and the marginal band on the hind wing also paler." (*de Nicéville, l. c.*)

Occurs at Wa-ssu-kow, Chow-pin-sa, Chia-ting-fu and Omei-shan in Western China.

In India, this species seems to be found throughout the season. De Nicéville states that it is common in Sikkim in February, March, September, October, and November. Mr. Elwes says that in Sikkim "this lovely insect is common at about 3000 to 6000 feet from June to December, but most abundant in July and August. I found it on forest-paths in sunny places."

Distribution. Sikkim, Naini-tal; Loharkhet; Kumaon [Himalayas]; Western China.

Ilerda saphir. (Plate XXX. figs. 2 ♂, 5 ♀, 1 var. ♂, 4 var. ♀.)

Thecla saphir, Blanchard, Compt. Rend. lxxii. p. 811 (note) (1871).

"Appartient au type des *Thecla quereus*, *T. spini*, etc.; les ailes d'un beau bleu métallique en dessus, avec les bords noirs, les postérieures ayant une raie marginale dentée rougeâtre; en dessous les quatre ailes d'un fauve terne, avec le bord des postérieures d'un rouge pale et une raie dentée blanche." (*Blanchard, l. c.*)

Male. Brilliant blue, brighter than in *I. tana* and without any purple in its composition. The outer margins of primaries are broadly bordered with black, the inner edge toothed along the nervules. Secondaries have the costa and inner margin broadly black, a bright red submarginal lunulated line and a bluish-white marginal line interrupted by the points of the red lunules. Tail tipped with white.

Female. Dark brown. The broad orange patch on primaries is very similar to that of female *I. tana*; discoidal spot black; submarginal band of secondaries as in the male but rather paler.

Under surface of both sexes ochreous. Primaries have a large velvety-black spot above the inner angle and sometimes a smaller linear black spot on the interspace above, these are inwardly bordered with whitish; the discoidal bar is faintly indicated. Secondaries have a

broad red submarginal band suffused with whitish and inwardly bordered by a lunulated white line; there is usually a small black dot in the cell.

The male specimen figured is rather paler than usual.

Var. **marica**. (Plate XXX, figs. 1 ♂, 4 ♀.) *Male*. Differs from the typical form in being larger, deeper in tint of ground-colour, and in having broader black margins, which are not inwardly dentated along the nervules; the submarginal red line is narrower, more strongly arched, and does not extend so far in the direction of the outer angle; the black tails, which are tipped with white, are longer and more slender.

Female. The orange patch on primaries narrower and more curved.

Under surface of both sexes yellowish. Primaries have a large velvety-black spot above inner angle, and sometimes a smaller linear black spot in the interspace above, these are inwardly bordered with whitish; there is an indistinct dusky bar at the end of the discoidal cell, an obscure dusky wavy line beyond which extends from costa to first median nervule, and an ill-defined submarginal line; secondaries have a small black spot in the discoidal cell and a similar one directly below it in the submedian interspace; there is an ill-defined, wavy, and indented central and dusky line; the outer marginal area is occupied by a series of broad confluent bright red lunules, the points of each lunule projecting into the white fringes; this is preceded by a series of white black-edged lunules; the red lunules are filled up with black, bordered outwardly with white; a black line precedes the fringes.

Expanse 40 millim.

The above form appears to be rather commoner than the type, but occurs in the same localities and may perhaps be a seasonal variety.

I. saphir, Blanchard, resembles *I. oda* on the upper surface, but agrees better with *I. epicles* on the under surface; it is, however, easily distinguished from the former by the absence of any purplish shade in the blue coloration of the male, and by the narrower submarginal fulvous bands on secondaries of the female.

The male of this species may be distinguished from *I. moorei*, Hewitson (= *saphir*, Elwes, Proc. Zool. Soc. Lond. 1882, p. 402, pl. xxv. figs. 9 ♂, 10 ♀), by the brighter and more decided blue on the upper surface, and both sexes by the different characters of the transverse markings on the under surface.

The commonest species of the genus found in China. It appears to be generally distributed in the west and occurs at Chang-yang and Ichang in Central China.

It has not been found possible to reproduce the exact colours of the males of the several species of *Ilerda*, and no figure, however carefully it may be executed, can convey a correct impression of the brilliancy of these insects.

Ilerda epicles. (Plate XXX. fig. 6, ♂.)

Polyommatus epicles, Godart, Enc. Méth. ix. p. 646 (1823).

Thecla epicles, Horsfield, Cat. Lep. E. I. C. p. 92, pl. i. fig. 3, ♀ (1829).

Ilerda epicles, Hewitson, Ill. Diurn. Lep. p. 58 (1865); de Nicéville, Butt. Ind. iii. p. 325 (1890).

- “Alæ supra fusce, maris violaceo micantes; antice disco, postice limbo apicali aurantio-fulvis, in mare ex lunulis approximatis efformato, fimbriâ albâ nigro interruptâ, anticorum obsolete; subtus omnes latè sulphureæ, limbo apicali sanguineo, posticarum lunulis albis intus marginato, maculisque cuneatis nigris in serie margini alæ parallelâ digestis; postice insuper puncto minuto nigro ante discum. (Exp. alar. lin. 13-15.)
- “Wings above blackish brown, with a violet reflection in the male, which is of a deeper shade towards the base, the anterior wing bearing a large irregularly rounded rufous-orange spot on the medial arcula, the hinder being marked with a posterior border of the same colour; in the male the medial spot is smaller, consisting of a transverse cloud, and in the posterior pair the border is narrowed and undulated at the inner edge, being composed of confluent lunules; a narrow undulated black streak passes along the posterior margin; the fringe is white, interrupted with black at the nervures, and in the fore wings evanescent towards the outer apical angle; the female has besides a short transverse black stigma before the disk of the fore wings, and in the hinder pair, near the middle, a faint orange dash; underneath the wings are bright sulphureous yellow; both pair have a sanguineous posterior border, which in the anterior wings is narrow and uniform until it approaches the inner apical angle, where it is terminated by a short black streak edged on both sides with white; in the posterior wings it is broader and ornamented internally by a series of white ares delicately edged on both sides with black; a series of small wedge-shaped black spots, bedded in an oblong sub-marginal cloud of white irrorations, is arranged parallel with the black marginal thread, which is confined by the extreme fringe; a minute black dot stands between the disk and base, and two more obscure ones are distinctly arranged along the inner margin; the fore wings have besides a very faint series of brown liture, and the hinder pair interrupted white streaks parallel with the post-marginal border; the anal appendage is terminated by a black spot and the tails have a white tip. The body is brown above and hoary underneath; the legs are alternately white and black; the antennæ are black with delicate white bands to the commencement of the club.” (*Horsfield, l. c.*)

Males from China agree very well with Sikkim examples, but in the female the red markings on upper surface are narrower than is usually the case in specimens of the same sex from that locality.

Referring to the variation of the species in India, Mr. de Nicéville (*l. c.*) observes:—“*I. epicles* is certainly the commonest and probably the most variable species of the genus. In the male on the upperside of the fore wing there is sometimes a faint orange irroration on the disc, this is sometimes developed into a moderately sized spot, sometimes the spot is as large as in the female; in this case, however, the male will be at once recognized by the beautiful purple colour seen in some lights, which is restricted to a well-

defined area at the base from the inner margin to the subcostal nervure, leaving the outer third of the wing and the costal area black. In the hind wing the rich vermilion-orange lunules on the outer margin vary in number and size, the purple area being confined to a small patch on the disc. On the underside the sanguineous outer margin of both wings varies much in width and prominence; in the fore wing the discal black lituræ are often absent, as are also the discal white spots on the hind wing. The female varies in the size of all the orange markings on the upperside, and of course lacks the purple coloration of the male. On the underside it varies exactly as in the male."

Occurs in Western China at Chia-ting-fu, where it is not uncommon in June and July. According to de Nicéville it is found in Kumaon, Nepal, Sikkim, Bhutan, Assam, Arracan Hills, Upper Burma, Java, Hainan (China), and Chin-Lushai.

Genus APHNÆUS.

Aphnæus, Hübner, Verz. bek. Schmett. p. 81 (1816); (part.) Hewitson, Ill. Diurn. Lep. p. 60 (1865); Moore, Lep. Ceyl. i. p. 105 (1881); de Nicéville, Butt. Ind. iii. p. 346 (1890).

Cigaritis (part.), Lucas, Explor. Alg., Zool. iii. p. 362 (1849).

Spimulasis, Wallengren, Lep. Rhop. Caffr. in Kong. Sv. Vet.-Akad. Hand. ii. p. 45 (1857); Distant, Rhop. Malay. p. 242 (1884).

Amblypodia (part.), Westwood, Gen. Diurn. Lep. ii. p. 477 (1852).

"Wings small.

"*Fore wing* triangular; first subcostal vein emitted at one half and second at one third before end of cell; third and fifth emitted together at a short distance beyond end of the cell, fourth at two thirds from below third and terminating at apex; discocellulars obliquely recurved, radial from their middle; middle median close to end of the cell, lower at one half before the end; submedian straight.

"*Hind wing* conical; costa gently arched, abdominal margin long, anal angle lobed; furnished with two tails; costal vein arched at base and curved to apex; first subcostal at one fourth before end of the cell; discocellulars recurved, radial from their middle; middle median from close to end of the cell, lower at one half before the end; submedian straight, internal recurved.

"Body short, robust.

"*Antennæ* club long, stout.

"*Palpi* porrect, squamose; second joint long, third short.

"*Legs* squamose, femora slightly pilose beneath.

"Type, *A. orcas*, Drury." (*Moore, l. c.*)

Aphnæus lohita. (Plate XXX. fig. 16, var. ϵ .)*Amblypodia lohita*, Horsfield, Cat. Lep. E. I. C. p. 106 (1829).*Aphnæus lohita*, Hewitson, Ill. Diurn. Lep. p. 61, pl. xxv. figs. 10, 11 (1865); de Nicéville, Butt. Ind. iii. p. 357 (1890).*Aphnæus zoilus*, Moore, Proc. Zool. Soc. Lond. 1877; de Nicéville, op. cit. p. 359.

"Alæ suprâ sordidè fuscæ canescenti-nebulosæ, cano fimbriatæ, maris saturatiore; antice e basi ad medium, postice paginâ totâ violaceo-micantes: fœminæ fasciis paginæ inferioris obsolete strigosæ: postice insuper plagâ anali triangulari fulvâ, lunulis duabus atris, intûs argenteo-irroratis freta: lunula interiore majore subocellari, appendiculo ipso imposita: subtûs flavæ, fasciis fulvis, in mare puniceis, margine simplicibus, singulis strigâ medianâ argenteâ continuâ vel parum interruptâ ornatâ: antice fasciis septem, duabus marginalibus completis, exteriorè inornatâ, tertiâ et quartâ abbreviatis pone discum confluentibus, quintâ completâ angulum aualem versus tendente, sextâ dimidiatâ teniâ fuscâ aræe analis dilatoris terminatâ, septimâ basali minimâ: postice fasciis sex, duabus exterioribus margini parallelis, secundâ completâ versus marginem interiorem areuatim productâ, tertiâ dimidiatâ, quartâ et quintâ completis in regione anali abruptè inflexis, sextâ basilari abbreviatâ; regione anali latè fulvâ, punctis ocellaribus duobus aterrimis fretâ, exteriorè caudis intermedio oblongo teniâ argenteâ intus aucto, intimo majore appendiculo ipso imposito angulari strigâ argenteâ brevi interiore ornatâ. Exp. alar. 1 unc. 3 lin." (*Horsfield, l. c.*)

Zoilus, Moore, differs from the type of *A. lohita*, Horsfield, in its larger size, different colour of the bands beneath, and narrowness of the marginal bands of the primaries. De Nicéville says that the only differential character of any importance between *zoilus* and *lohita* is the black bands on the underside of the former insect; these bands are not jet-black, but are faintly tinged with red.

Mr. Moore's types of *zoilus* were from the Andaman Isles, and the same writer subsequently recorded a specimen intermediate between *zoilus* and *lohita* from Mergui.

In all my Chinese specimens, which expand 42 millim., the bands on the under surface are perfectly black, and, as will be seen by reference to the figure (Plate XXX. fig. 16, ϵ), the outer margin of primaries is broadly black, and differs in this character only from *zoilus*.

Occurs at Moupin, Chia-ting-fu, Pu-tsu-fong, Wa-ssu-kow, and Omei-shan in Western China, and at Chang-yang in Central China.

Distribution. Himalayas, Assam, Burma, Malay Peninsula, Siam, Orissa, South India, Ceylon, Java, Philippines, China.

Aphnæus syama.*Amblypodia syama*, Horsfield, Cat. Lep. E. I. C. p. 107 (1829).*Aphnæus syama*, Hewitson, Ill. Diurn. Lep. p. 61, pl. xxv. fig. 7, ♂ (1865); Staudinger,

Exot. Schmett. p. 274, pl. xcv. ♂ (1888); de Nicéville, Butt. Ind. iii. p. 355 (1890).

Spindasis syama, Distant, Rhop. Malay. p. 243, pl. xxiii. figs. 8, 9, ♀ (1884).

“Ale supra fusca canescenti-nebulosa fasciis pagine inferioris obsolete notata, angulo anali posticarum fulvo punctis duobus aterrimis freta, exteriore maximo subocellari, singulis intus striola argentea auctis; maris arca anali anticarum paginaque fere tota posticarum violaceo micantes; subtus sulphurea, fasciis nigris strigivae argenteis internodiis continuis vel interruptis; anticae fasciis sex, duabus marginalibus completis, exteriore inornata, tertia dimidiata cui quarta brevissima parallela, quinta completa angulum analem versus tendente dimidio posteriore dilatate et denique attenuato, sexta dimidiata tamen fuscam arcae analis attingente, litura insuper basali longitudinali atra; posticae fasciis quatuor, marginalibus parallelis, exteriore abbreviata interrupta, secunda arcuatum trans regionem analem marginem inferiorem petente, tertia dimidiata, quarta completa in regione anali abrupte inflexa et ad marginem inferum longe protensa, maculis insuper tribus in serie interiore ordinatis singulis puncto centrali argenteo fretis et denique macula basali triangulari corpori contigua; regione anali late fulva punctis duobus aterrimis ocellata interiore orbiculari maximo appendiculo ipso imposito, singulis intus striolis argenteis auctis.

“Exp. alar. 13 lin.” (*Horsfield, l. c.*)

Chinese specimens appear to agree exactly with Sikkim examples in the Möller collection, and both vary but little in the ornamentation of the under surface.

Referring to the variation of this species in India, Mr. de Nicéville says:—“*A. syama* is a very variable species on the underside, and, but for the splendid series of it in my possession from Sikkim, for which I am indebted to Mr. Otto Möller, would be a very puzzling one. Typical specimens, which are the commonest, have the ground-colour pale yellow, or sulphureous as Horsfield describes it, with the bands black. In the next step we have the ground-colour still yellow, but the bands, instead of being black, are reddish black. The next step shows the ground-colour very pale yellow, the bands distinctly red. From this point there is every gradation from a very pale red to an ochreous deep red ground, the bands being much deeper red still; these specimens are typical *A. peguanus*, Moore.”

Occurs in the Province of Kwei-chow and at Wa-ssu-kow and Chow-pin-sa in Western China, and at Chang-yang and Ichang in Central China. According to de Nicéville it is common in Sikkim and the Khasi Hills, is not rare in Burma, and has been met with in Chin-Lushai. Its range extends to the Malay Peninsula, Java, and the Philippines.

Genus TAJURIA.

Tajuria, Moore, Lep. Ceyl. i. p. 108 (1881); Distant, Rhop. Malay. p. 244 (1884); de Nicéville, Butt. Ind. iii. p. 368 (1890).

- "Differs from *Pratapa* [= *Ctenota*, Hewitson] in the absence of both the tuft of hair on the fore wing and the glandular patch on hind wing of the male. Fore wing broader and more regularly triangular in form; venation similar; hind wing comparatively narrower and more produced hindward; cell broader, the subcostal and median branches emitted further from the base. Type *T. longinus*." (Moore, l. c.)
- "Anterior wings subtriangular; the costal margin moderately convex, the apex subacute, the outer margin moderately convex, the inner margin slightly sinuate. Costal nervure terminating on costa nearly opposite end of cell; first subcostal nervule emitted near middle of cell, second about midway between first and third, third a little before end of cell, third and fourth bifurcating at about or a little beyond half the length of the third; discocellular nervules suberect; first median nervule emitted at end of cell, second nearer to first than to third, third emitted at about two thirds from base. Posterior wings subovate; costal margin obliquely convex to apex, which is rounded; posterior margin obliquely rounded, prolonged in a more or less distinct angle at apex of second median nervule, and with two slender tail-like appendages situate respectively at the apices of the third median nervule and of the submedian nervure. Costal nervure extending to apex of wing; subcostal nervules bifurcating at about one third before end of cell; first and second median nervules with an apparently common origin a little before end of cell, third a little beyond middle of cell; submedian nervure slightly curved outwardly; internal nervure strongly curved inwardly. Body robust. Palpi perfect, the apex of the second joint not reaching the upper margin of the eyes." (Distant, l. c.)

***Tajuria luculentus*.** (Plate XXX. fig. 13, ♂.)

Iolais luculentus, Lecch, Entomologist, xxiii. p. 38 (1890).

Male. Light blue, finely dusted with black scales; costa and outer margin of primaries to below third median nervule broadly black. Secondaries with two white-tipped black tails; costa bordered with black, abdominal margin broadly whitish; two black spots on outer margin towards the black anal angle, which has an orange-brown lunule; fringes white, chequered with black at extremities of nervules and preceded by a black line. Under surface pale greyish white; primaries have linear discoidal spot and central transverse lines blackish; submarginal line dusky; secondaries have a blackish discoidal bar and transverse wavy central lines; there are also two blackish linear spots, one near base and towards costa, the other about the middle of inner margin; submarginal line dusky; a black spot at anal angle, and one between second and third median nervules, the first narrowly, and the last broadly, bordered with reddish orange.

Female. Paler; black border of primaries narrower over cell, disclosing a distinct black discoidal spot, beyond which is a whitish cloud.

Expanse, ♂ 40 millim., ♀ 44 millim.

Occurs in July at Chang-yang, Central China.

Allied to *Iolais longinus*, Hew.

Genus RAPALA.

Rapala, Moore, Lep. Ceyl. i. p. 105 (1881); Distant, Rhop. Malay. p. 276 (1885); de Nicéville, Butt. Ind. iii. p. 454 (1890).

"Allied to *Virachola*. Wings small.

"*Fore wing* comparatively shorter and less acutely triangular in form; exterior margin slightly convex; furnished with a broad tuft of hair on middle of posterior margin beneath.

"*Hind wing* less produced hindward, more convex exteriorly; anal angle lobed; a single tail from end of lower median vein; male with a broad conical-shaped glandular depression between the costal and subcostal veins, but which does not extend below the subcostal.

"*Palpi* shorter, second joint more laxly squamose.

"Type *R. varana*." (Moore, l. c.)

Rapala nissa. (Plate XXIX. figs. 12 ♂, 15 ♀.)

Thecla nissa, Kollar, Hügel's Kaschmir, i. pt. 2, p. 412, pl. iv. figs. 3, 4 (1818).

Deudorix nissa, var. (part.), Hewitson, Ill. Diurn. Lep. p. 23, pl. x. figs. 42, 43, ♂, 44, ♀ (1863).

Rapala nissa, de Nicéville, Butt. Ind. iii. p. 433 (1890).

Rapala subpurpurea, Leech, Entomologist, xxiii. p. 42 (1890).

"*Male*. Upperside: both wings shining bluish purple or deep steel-blue, variable in shape. Fore wing with the costa, apex, and outer margin purplish black, sometimes without any other marks, sometimes with a small orange patch beyond the cell, sometimes with a patch nearly as large as in *Hypodra selira*, Moore. Hind wing with the costal margin pale, the abdominal margin fuscous, the anal lobe black, with a patch of ferruginous scales near the middle. Underside: both wings with the ground-colour somewhat variable in tone, sometimes pale brown, sometimes ochreous brown. Fore wing with two fine dark lines defining the discocellular nervules; a very straight, even, decreasing discal band from the costa almost to the submedian nervure, outwardly finely defined with white; an obscure submarginal fascia. Hind wing with similar markings, but the discal band recurved to the abdominal margin, where it is defined on both sides with white; anal lobe black, submedian interspace on the margin also black, but heavily sprinkled with whitish scales, a black spot crowned with orange in the first median interspace.

"*Female*. Upperside: both wings rather duller in shade, otherwise similar to the male." (de Nicéville, l. c.)

"A variable species. The male is sometimes, as in Kollar's figure, without the red spot on the middle of the anterior wing, sometimes it is more distinctly marked than in the figure 42 of the plate. In colour it differs from other allied species, and, like the females of *varana*, Horsfield, and *pharolina*, Hewitson, is of a dull grey- or indigo-blue. On the underside the transverse band is far apart where the wings meet." (Hewitson, l. c.)

The first specimens of this species which I received from China I considered to be distinct from any described *Rapala*; but now that I have a larger amount of material, in the shape of specimens both from India and China, I find that my *subpurpurea* is not specifically separable from *R. nissa*.

The typical form of this species occurs in the Province of Kwei-chow, and at Wa-ssu-kow in Western China, and Chang-yang in Central China; but the form with the orange spot or patch on primaries (Hewitson, fig. 42) has only been received from Wa-shan, Wa-ssu-kow, and Chang-yang. Both forms were found in June and July at about 5000 feet elevation.

According to de Nicéville, *R. nissa* is found in Sikkim in March, April, May, August, September, and October—"some specimens of both sexes showing no trace of the discal orange spot on the upperside of fore wing, others having it quite small, while others again have it very large."

Distribution. Himalayas, Assam, Sumatra, Western and Central China.

Rapala repercutsa. (Plate XXIX. figs. 10 ♂, 13 ♀.)

Rapala repercutsa, Leech, Entomologist, xxiii. p. 42 (1890).

Male. Fuliginous brown, with strong purple reflections; fringes slightly paler; tail of secondaries black, tipped with white; lobe at anal angle marked with blue and pale orange. Under surface olivaceous brown; primaries have a faint pale linear discoidal spot and central transverse line, the latter with an interior edging of fuscous; submarginal line indicated only towards inner margin; secondaries have a dark discoidal bar outlined with white; a wavy white line broadly bordered anteriorly with fuscous, and preceded by a thin wavy white line, forming a compound band extending only to the submedian nervure, is intersected by the nervules, and exhibits a tendency to become broken up into spots; at its termination are two short parallel white lines running to abdominal margin; submarginal line whitish, wavy; a large velvety-black spot enclosed with orange in the second median interspace; the lobe at anal angle is black, with white fringe, above it is a blue spot, and two small patches, one orange and the other blue separated by a black streak; fringes of abdominal margin white.

Female. Rather browner, and the purple reflection is less intense.
 Expanse 40 millim.

Allied to *Rapala (Dendroxia) mauea*, Hew. Ill. D. L. p. 23, pl. ix. figs. 40, 41 (1863).

In some examples of the male there is a distinct reddish-orange cloud just beyond the discoidal cell on primaries; this is faintly indicated in other males and one female specimen.

Occurs in July at Chang-yang and Ichang, Central China, and at Omei-shan in Western China.

Rapala micans. (Plate XXVII. fig. 13, var.)

Thela micans, Bremer and Grey, Schmett. N. China's, p. 9 (1853); Ménétré's, Cat.

Mus. Petr. pt. i. pl. iv. fig. 4 (1855).

Thela cærulea, Bremer and Grey, tom. cit. p. 8; Ménétré's, tom. cit. pl. iv. fig. 3.

Thecla betuloides (Blanchard in litt.), Butler, Ann. & Mag. Nat. Hist. (5) vii. p. 34, pl. iv. fig. 2 (1881).

Male (*micans*, B. & G.). "Alis supra: ceruleo-micantibus; posticis caudatis; subtus cinereis, linea nigra submarginali, externe albo-marginata, angulo ani maculis duabus nigris, supra externam lunula fulva.

"Expans. alar. antic. unc. 1 $\frac{3}{8}$."

"The upper surface of the wings is shining blue, and the hind wings are tailed. Under surface is ashy grey merging into yellowish; towards the middle of all the wings there is a short indistinct line, which is bordered inwardly on the primaries, and outwardly on the secondaries, with darker. A wavy black line runs from the costa of primaries towards the inner angle, and from the costa of secondaries towards anal angle, before which it ends in a **W**-shaped mark as in *T. w-album*, but the angles of the **W** are rounded; there are two round black spots at the anal angle and above the outer one is a yellowish lunular spot; between these black spots the ground-colour is darker and dusted with whitish." (*Brewer & Gray, l. c.*)

Female (*caralata*, B. & G.). "Alis supra: ceruleo-micantibus, posticis caudatis, duabus maculis fulvis ante caudam; subtus: fulvescentibus, fasciis obscurioribus, stringis luteis interne marginatis; posticis fasciis aurantiaca, ante caudam maculis tribus nigris, media cinereo-ceruleo pruinosa.

"Exp. alar. antic. unc. 1 $\frac{1}{2}$."

"The upper surface of the wings is shining blue, with a fulvous spot at anal angle of secondaries, and a similar spot is placed before the slender tail, which is an eighth of an inch in length and is tipped with white. Under surface of the wings ochreous yellow, discoidal bar of primaries bordered with paler and transversely bisected by a pale line; beyond the cell is a dark band, bordered with paler, which runs obliquely from the costa towards inner angle. Parallel with the fringes is a broad dark band which is traversed throughout by a paler line. The secondaries are marked similar to the primaries, only the inner band terminates towards anal angle in a black zigzag line bordered with white as in *T. w-album*; the submarginal band terminates in a longitudinal orange patch bordered outwardly with white and enclosing three black spots, the first and third of these spots are round, and the second lunular and sprinkled with blue." (*Brewer & Gray, l. c.*)

Var. *betuloides*, Butler. (Plate XXVII. fig. 13, ♂.) "Above chocolate-brown, shot with purple, excepting on the outer border: primaries with a large patch of bright orange on the disk immediately beyond the cell; secondaries with an orange patch at the anal angle. Under surface grey; the cells closed by a short brownish fasciole with darker marginal lines edged externally with white; an oblique discal band and a second band nearer and parallel to the outer margin of the same colours; a submarginal dusky stripe, followed in the secondaries by a white marginal line; base of fringe occupied by a black line; secondaries with an orange anal patch enclosing a black dot on the first median interspace; a subanal **W**-shaped blackish line joining the inferior extremity of the inner discal band, its inner edge bordered with orange and its outer edge with white; anal lobe and tail black; pectus white, venter testaceous. Expanse of wings 1 inch 4-6 lines. 3 sp. Kiukiang, China." (*Maries.*)

"This species cannot be regarded as described by Blanchard; that author simply remarks: 'In the neighbourhood of Peking an allied species exists which

is distinguished by several characters'; and in a footnote he adds: 'This species (*Thecla betuloides*, Lucas) has the wings tinted with blue above and grey below.' (Butler, *l. c.*)

The bright orange patch on primaries, which is the distinguishing character of var. *betuloides*, may occupy a large portion of the disc, or, on the other hand, may be only very faintly indicated. All the intergrades occur.

Bremer and Grey do not mention the sex of either of their types from Pekin, but I have scarcely any doubt that their *carulea* is the female of their *micans*. The figure of the latter in Ménétriés' 'Catalogue' (pl. iv. fig. 4) appears to have been made from a poor specimen.

A very common species, occurring throughout the northern, western, and central portions of China.

Fixsen (Rom. sur Léop. iii. p. 268), in his subdivision of the *Thecla* group of Lycaenidae, places *icana*, Moore, as a synonym of *micans*; but these two species are not even congeneric, the former is a *Zephyrus* and the latter a *Rapala*. In this arrangement, *ataxus*, Hewitson, is placed in one genus, and its female *katura*, Hewitson, in another genus. *Ilerda oda* and *Ilerda saphir*, Blanchard, are also placed in different genera. Many other similar instances might be cited, but those referred to will suffice to show that Dr. Fixsen's revision of the group is one which cannot be accepted as it now stands.

Specimens intermediate between typical *micans* and var. *betuloides* are not uncommon.

Rapala arata.

Thecla arata, Bremer, Lep. Ost-Sib. p. 25, pl. iii. fig. 6 (1864); Pryer, Rhop. Nihon. p. 15, pl. iv. fig. 10 (1887).

Thecla ichnographia, Butler, Journ. Linn. Soc., Zool. ix. p. 57 (1866).

Thecla tyrianthina, Butler, Ann. & Mag. Nat. Hist. (5) vii. p. 34, pl. iv. fig. 5 (1881).

Thecla arata, var., Fixsen, Rom. sur Léop. iii. p. 281, pl. viii. fig. 3 (1887).

"Alæ supra aut violaceo- aut argenteo-ceruleo-micantes, marginem posteriorem versus obscuriores: posticæ caudatæ angulo anali subretundato nigro et fulvo.

"Alæ subtus alææ, anticarum dimidio basali, posticarum dimidio inferiore nigricantibus.

"Alæ omnes macula discoidali elongata, fascia transversa, fascia submarginali margineque posteriore nigricantibus: posticæ plaga magna fulva, prope angulum analem maculas nigras quatuor includente, angulo ani subretundato nigro. 32 m." (Bremer, *l. c.*)

Thecla ichnographia, Butler.—"Alæ supra chalybeo-purpureæ, ad marginem posticum fusciscentes: posticæ angulo anali in caudam obtusam rufam nigro cinctam producta, venaque mediana prima cauda tetral terminante. Corpus fuscum.

"Ala antice subtus nivea, basi fusco-pallida, cella ante finem fascia tenui alba, fascia obliqua fusca pallida post cellam posita et ante marginem anteriorem terminante: margine postico nigro marginato fasciisque duabus fuscis pallidis submarginato, inferiore venis albis interrupta: postica area abdominali fusco-pallida, lineis tribus albis apud marginem analem cellaque ante finem linea alba scripta, fascia obliqua fusco-pallida post cellam posita et a veno mediano secundo terminata, margine postico nigro marginato, apicali fasciis duabus pallidis submarginato, inferiore venis albis interrupta, angulo anali macula lata quadrata flava maculas quatuor nigras ex aequo distantes includente, cauda anali nigra.

"Corpus pallidum, cinereo-fuscum.

"Alar. exp. unc. $1\frac{3}{16}$."

"Allied to *T. battus*, Cramer." (*Butler, l. c.*)

Var. **tyrianthina**, Butler. "Above brown, shot with purplish blue in the male and with purple in the female. Under surface of wings pale greyish brown, darker towards the base: a brown fasciole, traversed by a pale line, at the end of the cell; a broad, slightly tapering discal brown belt from the costal margin of each wing; a submarginal brown stripe and a marginal brown border: secondaries with an orange patch enclosing a square of four black spots, bounded above by an incomplete **W**-shaped black line, and below by an alternately white and black fringe; a black-edged whitish oblique band near the anal angle across the abdominal border, bounded internally by a brown band, and externally by an orange marginal border: anal lobe and tail black, tipped with white: pectus greyish, palpi white below, venter testaceous. Expanse of wings 1 inch 3-4 lines. Allied to *T. arata*." (*Butler, l. c.*)

Occurs at Kiukiang, Central China, Gensan in the Corea, and also in Japan.

This form is smaller and darker than the type, and differs from it also in the brownish coloration of under surface; the central band on under surface of primaries tapers towards inner angle, above which it unites with the submarginal band. The differences do not, however, appear to be of specific value, as the brownish coloration of under surface is found in some otherwise typical specimens of *R. arata* from Japan, and in other Japanese specimens the central band of primaries tapers as in var. *tyrianthina*. These are probably seasonal forms.

Pryer records *R. arata* from Nikko, Fujisan, Gifu, and Yesso, and says that it occurs in these places from May to July. I took specimens at Hakodate in August.

Fixsen (*l. c.*) mentions specimens from Corea, and also a form with fulvous patches on primaries, which he figures. Elwes (Proc. Zool. Soc. Lond. 1881, p. 885) states that Bremer records it from Peking, and Maries from Kiukiang.

The glandular patch towards costa of secondaries of male, the character of the markings of under surface, and the occasional occurrence of a fulvous patch on primaries of the female show that this species certainly belongs to *Rapala*, in which genus I have therefore placed it.

Fam. PAPILIONIDÆ.

Subfam. PIERINÆ.

Genus DELIAS.

Delias, Hübner, Verz. bck. Schmett. p. 91 (1816); Moore, Lep. Ceyl. i. p. 139 (1881);
Distant, Rhop. Malay. p. 289 (1885).

Pieris, section 1, Doubleday, Gen. Diurn. Lep. p. 44 (1847).

“Anterior wings somewhat elongate; costal margin moderately convex, the apex rounded, outer margin obliquely rounded, inner margin nearly straight. Costal nervure extending to about two thirds of the wing; first subcostal nervule emitted at about one fourth before end of cell, second and third bifurcating near apex of second, fourth springing from second at about one third beyond end of cell; upper discocellular obliquely directed outwardly, lower discocellular somewhat concave; discoidal nervule emitted at central apex of cell; median nervules emitted wide apart, first and second a little nearer to each other than second and third. Posterior wings elongately subovate; the costal margin oblique, the posterior margin convex, abdominal margins obliquely divergent towards anal angle. Costal nervure extending to about two thirds of costal margin, first subcostal nervule emitted at about one third before end of cell, second almost midway between bases of the first and of the discoidal nervule; upper discocellular oblique, lower discocellular very slightly concave; upper median nervule emitted at apex of cell, second and third median nervules almost twice as wide apart at base as first and second; submedian nervure slightly curved outwardly; internal nervure reaching about centre of abdominal margin. Body somewhat robust; head and pronotum clothed with long hairs; palpi porrect, extending considerably beyond the head, and clothed with long hairs beneath; legs long and slender; antennæ with a well-formed and moderately-channelled apical club.” (*Distant, l. c.*)

***Delias belladonna*.** (Plate XXXVII. figs. 3 ♂, 4 ♀.)

Papilio belladonna, Fabricius, Ent. Syst. iii. p. 180 (1793); Donovan, Nat. Rep. i. pl. xxxv. (1823).

Pieris horsfieldii, Gray, Zool. Miscell. i. p. 32 (1831).

Pieris belladonna, Gray, Lep. Ins. Nepal, p. 7, pl. viii. fig. 2 (1846).

Delias belladonna, var. *horsfieldii* ♀, Elwes, Trans. Ent. Soc. Lond. 1888, pl. x. fig. 3.

Delias belladonna, var. *zelima*, Mitis, Iris, 1893, p. 131.

“*P. H.* alis oblongis integerrimis atris: anticis hyalino punctatis, posticis flavo maculatis.

“*Papilio belladonna*. Jon. fig. pict. 3, tab. 37, fig. 2.

“Statura *P. Pasithoi* at major. Corpus nigrum abdominis marginibus cinereis. Alæ atræ, cinereo punctatæ. Subtus concolores at lineola maculaque bascos albis. Posticæ atræ, flavo maculatæ macula bascos angulicæ aui majoribus. Subtus fere concolores.” (*Fabricius, l. c.*)

Delias horsfieldii, Gray.—“Alis suboblongis, integerrimis, nigris, maculis albidis triangularibus, anticis subtus maculis apicalibus tribus flavis; posticis basi margineque interiore flavis, subtus maculis ad marginem posteriorem flavis.

“Expansio alarum 3½. Habitat in Nepaul.” (*Gray, Z. M.*)

Delias belladonna, Gray.—“Wings black with whitish dashes and spots; the base of the hinder wings and the interior margin yellow.

“Under surface of the fore wings black, spotted with white, and with three apical yellow spots; the hind wings black, the interior margin and spots yellow, with four central white ones.

“Expanse of wings three inches and a half.” (*Gray, L. I. X.*)

Occurs commonly at Omei-shan and Monpin, Western China, in July and August at an elevation of 3000 to 4000 feet. Both sexes (Plate XXXVII. figs. 3 ♂, 4 ♀) agree exactly with specimens in my collection that were taken in Kulu, and only differ from Kangra examples of the *horsfieldii* form in Mr. Elwes's collection in being somewhat larger. I believe the specimens here figured represent typical *belladonna* of Fabricius.

In his ‘Catalogue of the Lepidoptera of Sikkim’ (T. E. S. 1888, p. 408), Mr. Elwes, referring to *D. belladonna*, says:—

“Having recently written on this species, I was careful to take especial notice of its habits during my last visit to India, and, though I am not able to change my opinion that there is only one species under the several names which have been given to it, yet I am able to add something to our previous knowledge. I found the dark form *ithiela** most common in Sikkim from May to August at low elevations, 2000 to 4000 feet, where it frequents the banks of streams in hot, thoroughly tropical valleys, and flies slowly about the water side, resting sometimes on mud and pebbles almost in the water. Some specimens of the variety with yellow on the abdominal margin occur here with the pure black one, and some have white or only a yellow tinge in the same part of the hind wing. But neither Möller nor I have ever taken females with the males in these places, and all the five females I possess of this form were procured from native collectors, and vary in the same particulars as the males. I never saw a typical *horsfieldii* at these low elevations, but found it in the dense forest on Sinchul at 6000 to 8000 feet, where it settles on paths and in damp places on the ground, and flies slowly in the same manner as *ithiela*. The only female of this form which I got was taken by my native assistant at an elevation of nearly 11,000 feet, on the road

* *Delias* (*Thyca*) *ithiela*, Butler, Ann. & Mag. Nat. Hist. (4) iv. p. 242 (1869); Lep. Exot. pl. xxiv. fig. 1 (1871).

between Tonglo and Sundukpho, where it had probably been driven up by the wind, and both this and another similar female given me by Möller are intermediate between the *ithiela* females and those of the typical *horsfieldii* from the North-west Himalayas. In the Khasia hills I was fortunate enough to find *belladonna* in its breeding-places, which are the small patches of natural forest left on the higher parts of the hills at from 4000 to 6400 feet elevation. Here it is in some places abundant, and I found the females almost as plentiful as the males. In the wood which crowns the summit of the Shillong peak I had several opportunities of observing the habits of the insect, which are quite different from what I saw in Sikkim. They fly on sunny days about the tops of the trees, and make little excursions into the open country round, always returning to the shelter of the wood, and frequently descending to settle on the flowers of a species of *Euonymus*, and of a large species of *Scabiosa* which grew on its outskirts. The flight is slow, graceful, and soaring, and the butterflies are not at all shy. Here I found hardly any variation in the insects, all being true *ithiela*, excepting two specimens, which were slightly tinted with yellow on the abdominal margin. I figure a female of the Khasia form, which has also been named *berinda* by Moore, and a female of the *horsfieldii* type from Sikkim, which closely resembles the North-western *horsfieldii* from the Mandra plateau, in Kulu, taken at 8000 feet by Capt. Graham Young. These are selected from 35 males and 18 females in my collection.

“The facts as to the geographical distribution of this species which we know are as follows:—In E. Tibet, and probably S. China, the typical *belladonna* of Fabricius is the dominant form. In Sikkim at 6000 to 10,000 feet the same form, somewhat darker. In Nepal and the North-western Himalayas *horsfieldii* of Gray is found. In the Khasias, and at low elevations in Sikkim, we have the dark variety, *ithiela*, varying in colour of the abdominal margin, which is sometimes yellowish and sometimes white.” (*Elwes, l. c.*)

Herr Mitis informs me that his *D. belladonna*, var. *zelima* agrees exactly with Plate XXXVII. figs. 3, 4 in the present work. If this is so, then I think his insect is typical *D. belladonna*.

Delias sanaca. (Plate XXXVII. figs. 5, 6, 7, 8, vars.)

Pieris sanaca, Moore, Cat. Lep. E. I. C. i. p. 79 (1857); Proc. Zool. Soc. Lond. 1857, p. 103, pl. xlv. fig. 6, nec 4.

Delias flavalba, Marshall, Proc. Zool. Soc. Lond. 1882, p. 759.

Delias belladonna, var. *adelma*, Mitis, Iris, 1893, p. 130.

- “Upperside white: fore wing with the veins and veinlets broadly clouded with black, leaving only a row of lanceolate white spots on the outer margin, and another row of more linear marks extending across the disc: hind wings with the veins and veinlets sharply defined with black; discoidal and median veins clouded with black, the latter broadly so: also a marginal row of angulate lunar marks; anterior base and anal angle bright yellow.
- “Underside: fore wing as in the upperside, but the white markings more clearly defined, those near the anterior angle being yellowish; hind wing with the dark colour broader, and the white spaces nearly covered with yellow. Shape of wings as in *P. belladonna*.
- “Expanse $3\frac{1}{4}$ in. Darjeeling.” (*Moore, Cat. Lep. E. I. C.*)

This species is represented in China by two very distinct local races which I describe as follows:—

Var. *subnubila*, var. nov. (Plate XXXVII. figs. 7 ♂, 8 ♀.) *Male*. Primaries heavily suffused with black; there are some elongate internervular patches of the ground-colour on the central area, and a streak in submedian interspace; marginal spots whitish and triangular. Secondaries whitish suffused with blackish, the ground-colour showing as internervular patches and a streak in the cell; abdominal margin broadly whitish merging into bright yellow towards anal angle. Under surface as in the type, but there is less white on primaries.

Female. Darker; markings on secondaries tinged with yellow, and with the exception of a yellowish streak on its outer edge the abdominal margin is entirely whitish.

Occurs at Moupin, Huang-mu-chang, and Pu-tsu-fong, Western China, in July and August.

Var. *adelma*, Mitis*. (Plate XXXVII. figs. 5 ♂, 6 ♀.) *Male*. Black with greyish streaks in the cell and between the nervules on all the wings; the marginal spots are greyish and smaller than in var. *subnubila*. Under surface similar to that of var. *subnubila*, but there is less white in the markings.

Female. Brownish black; the abdominal margin is broadly whitish tinged outwardly with yellowish.

Occurs at Chang-yang, Central China, in June and July.

D. sanaca appears to be even more variable than *D. belladonna*. Some

* Seeing that Herr Mitis had recently described two forms of *D. belladonna* from China, I sent him a proof impression of my Plate XXXVII., asking him to be good enough to say if either of the figures thereon agreed with the specimens he had named and described. In reply I am informed that figures 5 and 6 represent *D. belladonna*, var. *adelma*, Mitis, and that figures 3 and 4 agree with *D. belladonna*, var. *zolina*. Herr Mitis is certainly in error in referring var. *adelma* to *D. belladonna*, as it is undoubtedly a form of *D. sanaca*, which may be readily seen by the shape of the yellow discoidal streak on under surface of secondaries.

West-Himalayan specimens are much whiter than the type, and the Western Chinese form is intermediate between the type and the black Central Chinese form.

All forms of this species may be easily distinguished from those of *D. belladonna* by the striated rather than round character of the pale markings of both surfaces and by the clubs of the antennæ being white or whitish instead of black.

Distribution. North-western Himalayas, Simla, Kulu (*Elwes*), Central and Western China.

Delias patrua. (Plates XXXVII. figs. 1 ♂, 2 ♀, XXXV. fig. 1, var. ♂.)

Delias patrua, Leech, Entomologist, xxiii. p. 46 (1890).

Male. Black. Costa, inner angle, discoidal cell, and nervular interspaces streaked with grey, the streaks in latter are attenuated towards outer margins, before which they unite with a whitish-centred grey spot, those nearest apex are linear, and the streaks preceding are not always well defined. Secondaries, inner area of the wings within submedian nervure, and a portion of interspace above canary-yellow, each interspace above has a grey streak, those between the median nervules are centred with white, and the upper one is only separated from a broad discal streak by the disco-cellular nervule; a series of grey spots before the outer margin, those nearest anal angle with yellow linear centres. Under surface black: primaries with the streaks and spots as above, but white; the costa is only sprinkled with grey scales; there are two short yellow dashes between costa and submedian nervure towards apex, and the spots nearest apex are more or less yellow: secondaries have canary-yellow markings; a broad patch at the base intersected by the pre-costal; a broad streak, whitish towards base, in the discoidal cell; inner area as above; a central and submarginal series of spots, but the former are only suffused with yellow to a greater or lesser extent. Fringes grey and black.

Female. Fuliginous-black, the costa less grey, the streaks are shorter and are not connected with the spots towards outer margin; the inner area above is whitish towards abdominal fold.

Expansion, ♂ 88 millim., ♀ 92 millim.

Closely allied to *D. belladonna*, but at once separated by the 'apparent absence of yellow patch at base of secondaries. There is a yellow dash on the costa of secondaries, but this is of small size, and it is always completely hidden by the inner margin of the primaries.

Occurs at Chang-yang, Central China, in June and July.

Var. ***lativitta***, var. nov. (Pl. XXXV. fig. 1, ♂.) *Male.* Black. Primaries streaked with white in the discoidal cell and each nervular interspace; there is a broad white streak in the submedian interspace extending almost from the base of the wing to the outer margin; this

streak is traversed throughout its length by a black line, and is slightly contracted, as also are the streaks above, before the outer margin. Secondaries have a yellow patch on the subbasal area of costa; the cell and interspaces are streaked with white, the streaks in the latter are followed by diffuse white or whitish spots; the whole of the abdominal area and a large portion of the submedian interspace are yellow. Under surface of primaries similar to upper, but the white streak in cell is striated with black on its outer half, and the internervular streaks are each broken up into an inner large oblong spot and an outer round spot connected by a white line, which is continued through the outer spot almost to the margin of the wing: secondaries have yellow basal and subbasal spots; there is a white streak, tinged outwardly with yellow, in the discoidal cell; beyond these is a series of five whitish spots varying in size; the inner marginal area is yellow as above, and there is a series of six (the sixth double) spots of the same colour before the outer margin.

Expanse 90-100 millim.

One example captured at Ta-chien-lu in July, and one taken at Moupin in August.

Mr. Elwes has this species from Bernardmyo, Burmah, where it was taken in May at an elevation of 6000 feet by Mr. Doherty. The specimen submitted to me for examination does not differ from typical *D. patrua* in any important character.

Genus CATOPSILIA.

Catopsilia, Hübner, Verz. bek. Schmett. p. 98 (1816); Distant, Rhop. Malay. p. 295 (1885).

“Anterior wings subtriangular; costal margin arched and convex, outer margin oblique, inner margin slightly sinuate. Costal nervure arched and extending beyond the middle of costal margin; first subcostal nervule emitted at about the middle of cell, second from near end of cell, third and fourth bifurcating at about two thirds the length of third, fifth bifurcating from third at about one third beyond cell; discocellular nervules oblique, both somewhat concavely bent inwardly; discoidal nervule emitted from about their middle; first and second median nervules with their bases slightly nearer to each other than those of second and third. Posterior wings broadly subovate, costal and outer margins convex, the abdominal margins obliquely divergent at anal angles. Costal nervure arched and not quite reaching apex of wing, subcostal nervules bifurcating at about one fourth before end of cell, discocellulars oblique, the lowermost the longest and slightly bent inwardly; upper median nervule from end of cell, the bases of the first and second about one fourth nearer together than those of second and third; submedian nervure nearly straight, very slightly curved; internal nervure slightly curved. Body stout, pronotum hairy; palpi porrect, projecting one third beyond the head, second joint laterally compressed; legs slender; antennae gradually thickened into an apical club, which is truncate at tip.

“Male with a tuft of silky hairs near base of inner margin of anterior wings, and with a glandular patch of raised scales above the subcostal nervure of the posterior wings.

“This genus until quite recently was better known under the name of *Callitryas*, and embraced a

number of American species as well as those of the Old World. Subsequent and more careful examination has shown that the butterflies of these areas are generically quite distinct, the peculiarity in venuration of the wings being sufficient to easily separate them. The Old World species are thus grouped under Hübner's genus *Catopsilia*, and are found in Western, Southern, and Eastern Africa, Madagascar and the African islands, continental India, the Malay Peninsula, throughout the Malayan Archipelago, and also in Australia and New Zealand." (*Distant, l. c.*)

Catopsilia crocale.

Papilio crocale, Cramer, Pap. Exot. i. pl. lv. figs. C, D (1779).

Papilio jugurtha, Cramer, op. cit. ii. pl. clxxxvii. figs. E, F (1779).

Catopsilia crocale, Moore, Lep. Ceyl. i. p. 122, pl. xlviii. figs. 1, 1 a, b (1881); Distant, Rhop. Malay. p. 296, pl. xxv. figs. 11 ♂, 12 ♀ (1885).

"*Male*. Wings above very pale greenish white; anterior wings with the costal and outer margins—broadest at apex and not reaching the outer angle—dark fuscous; the basal third of wing and costal area to a little beyond end of cell sulphur-yellow; posterior wings with the inner half—concave externally—sulphur-yellow. Wings beneath pale stramineous, with an ochraceous tinge; anterior wings with the lower half—beneath cell and extending to outer margin—pale greenish white. Body above with the pronotum dark and thickly covered with long pale greenish hairs, the abdomen pale ochraceous, eyes castaneous, body beneath with legs more or less concolorous with wings.

"*Female*. Wings above greenish white or pale sulphureous, both wings with the basal areas more or less suffused with darker sulphureous or pale ochraceous as in male. Anterior wings with the costal and outer margins broadly and irregularly dark fuscous, broadest at apex, where there is a more or less distinct subapical fascia enclosing some pale apical spots; a dark fuscous spot at end of cell sometimes connected with the dark costal margin. Posterior wings above with the outer margin broadly and irregularly dark fuscous, sometimes having some faint and obscure pale fuscous submarginal markings. Wings beneath as in male, but darker, with one small discocellular spot on anterior wings and two on posterior wings.

"*Expanse* ♂ 52–68 millim., ♀ 70–78 millim." (*Distant, l. c.*)

I have one male specimen from Kiukiang, Central China, where it was captured in June. It does not differ in any respect from North-west Himalayan examples in my collection.

The larva, which is said to feed on various species of *Cassia*, is, together with the pupa, figured in the 'Catalogue of the Lepidopterous Insects in the Indian Museum,' by Horsfield and Moore.

This species is common in most parts of India, and has been recorded from Burmah, Ceylon, Malay Peninsula, Philippine Islands, Celebes, Hong-Kong, and Australia.

Genus TERIAS.

Terias, Swainson, Zool. Ill. 1st ser. t. 22 (1820); Boisduval, Sp. Gén. i. p. 651 (1836); Doubleday, Gen. Diurn. Lep. i. p. 76 (1847).

“HEAD small, clothed with short hairs.

“*Eyes* round, rather prominent.

“*Labial palpi* rather short, projecting but little beyond the forehead; densely clothed with short round scales at the sides, with longer ones in front. First joint slightly curved, broadest at the base, slightly compressed at the sides; second joint scarcely one third the length of the first, oval; third joint minute, oval, clothed with very small scales, almost hidden beneath the scales of the second joint.

“*Antennæ* rather short, moderately stout, gradually incrassated beyond the middle; the apex rounded.

“THORAX slender, hairy.

“*Anterior wings* subtriangular, generally rounded at the apex, rarely acuminate; the costa much curved at the shoulder; the inner margin slightly emarginate. Costal nervure rather stout. Subcostal nervure four-branched; the first nervure thrown off about the middle of the cell; the second just before the end of the cell; the third nearer to the apex than to the end of the cell. Upper discocellular nervure wanting; middle discocellular rather shorter than the lower. Upper discoidal nervule united for a greater or less distance to the median nervule. Internal nervule wanting.

“*Posterior wings* mostly broadly obovate, or rounded, sometimes angular. Precostal nervule nearly atrophied. Discoidal nervule sometimes appearing to be a third submedian, at others thrown off exactly where the subcostal nervure branches, sometimes above that point. Discocellular nervule much curved. Abdominal fold broad.

“*Feet* slender. Tarsi long, very spiny. Claws deeply bifid; the outer tooth mostly more slender and acute than the inner. Paronychia as long as, or longer than, the claws; sometimes broad, nearly covering the claw, sometimes narrow, lanceolate; fringed with delicate hairs. Pulvillus jointed, very broad at the end; about equal in length to the claws.

“ABDOMEN slender, arched, not quite so long as the abdominal margin of the posterior wings.

“*LARVA* long, slender, linear, scarcely tapering towards either extremity.

“*Pupa* smooth; keeled along the back, navicular, somewhat compressed laterally, not tuberculate at the sides; the head very pointed.” (*Doubleday, l. c.*)

***Terias læta*.**

Terias læta, Boisduval, Spec. Gén. Lép. p. 674 (1836); Pryer, Rhop. Nihon. p. 10, pl. ii. fig. 10 (1881).

Terias jageri, Ménétrics, Cat. Mus. Petr. Lep. p. 84, pl. ii. fig. 1 (1855).

Terias bethesba, Janson, Cist. Entom. ii. p. 272 (1878); Pryer, l. c. fig. 11.

Terias biformis, Pryer, l. c. p. 21.

Terias subferrens, Butler, Ann. & Mag. Nat. Hist. (5) xi. p. 278 (1883).

- “ Enverg. 16 à 18 lignes. Cette espèce est bien distincte de toutes celles de genre par ses premières ailes, dont le bord postérieur est coupé droit, avec le sommet aigu. Dessus des quatre ailes d'un jaune goume-gutte, moins vif que dans *hecabe*, les supérieures ayant la base un peu saupoudrée de noirâtre, et une bordure noire, presque aussi large que dans *hecabe*, commençant en pointe vers la base de la cote, et finissant carrément, une ligne avant l'angle interne, sans décrire aucun sinus quadrangulaire; cette bande s'élargit graduellement au sommet, et est un peu sinuée et légèrement denticulée intérieurement; frange d'un jaune rosâtre, ainsi que le bord de la cote. Ailes inférieures moins arrondies que dans la plupart des espèces, tantôt sans taches, tantôt avec un commencement de bordure noirâtre sur l'angle externe, et quelquefois avec une rangée de petits points marginaux noirs. Dessous des premières ailes jaune, avec les bords antérieur et postérieur d'un jaune roussâtre. Dessous des secondes d'un jaune roussâtre pâle, avec deux raies transverses droites, plus obscures, dont l'antérieure longue, située au milieu de l'aile, et la postérieure courte; la base et le bord antérieur marqués de trois ou quatre points obscurs, souvent effacés et à peine visibles.”
- “ Bengale (Coll. Boisdu). Sur plus de quarante individus recueillis à Bombay par feu Polydore Roux, nous n'avons point remarqué de différence bien tranchée entre le mâle et la femelle.
- “ Nous possédons une variété femelle que M. de Haan nous a envoyée comme venant du Japon, qui est un peu plus grande, et chez laquelle la bordure est divisée par deux ou trois traits jaunâtres, obsolètes. Du reste, elle offre tous les caractères des individus ordinaires.” (*Boisduval, l. c.*)

Var. *subfervens*, Butler. “ Nearly allied to *T. jayperi* of Japan, with which it agrees on the upper surface; on the under surface, however, the costa and apex of the primaries, and the entire surface of the secondaries, are of a reddish gravel-colour, deeper even than in the males of *T. lata*. Expanse of wings 40-41 millim.

“ South Coast, Carzolo Island, S. Corea, November 19th.

“ The above differences are based upon three examples compared with seven of *T. jayperi*; of the latter, however, I have examined about fifty specimens, and never found anything at all approaching *T. subfervens* in the coloration of the under surface.” (*Butler, l. c.*)

Var. *bethesba*, Janson. “ *Male*. Above lemon-yellow, the primaries narrowly margined with black on the costa, the apical black band commencing on the costa about one third from the apex, thence obliquely narrowed to about one third across the wing, and then gradually narrowed to the anal angle, the posterior two thirds having three well-marked semicircular emarginations on its inner edge; secondaries with a very narrow black marginal line slightly dilated anteriorly; beneath rather paler yellow than above, with fine sparingly scattered black scales, which form two indistinct transverse bands on the secondaries, the extremity of all the nervures marked with a very small black spot; the body black above, with pale yellow pubescence on the thorax, the side of the abdomen yellow with a fine black longitudinal line, the underside and legs pinkish white.

“ The female is smaller and of a paler yellow than the male, with the wings rather thickly speckled with black, the apical band on the primaries ends abruptly just before the anal angle, and the secondaries have a narrower black margin and a large rather ill-defined black spot at the anterior angle.

“ Expanse of wings 1 inch 4 lines-1 inch 8 lines. Yokohama.

“ Allied to *T. lata*, Bdv., but differs in having the primaries more rounded at the apex, and in its paler colour and in the form of its markings.” (*Janson, l. c.*)

T. lata is very common in Japan and China in the autumn, and appears again after hibernation. The specimens differ from N.W. Himalayan examples, of which I have a long series, in having scarcely any black markings on margins of secondaries, and in the redder tone of under surface. Extreme examples of this form from Japan and South Corea are described by Mr. Butler as *T. subferrens*.

The late Mr. Henry Pryer (*l. c.* p. 21) placed *T. bethesba*, Janson, as a synonym of *T. lata*, Boisduval, and merged both in *T. biformis*, Pryer, giving the following reasons for doing so:—"I have, in conjunction with Mr. Nawa, of Gifu, made an extremely interesting and important discovery. It is that *T. bethesba* is the summer form, and *T. lata* the winter form, of one and the same species. This was quite unexpected. Both Mr. Nawa and myself saw females of *T. bethesba* depositing their eggs on *Cassia mimosoides*. From these eggs we reared many specimens of *T. lata*, but not a single individual bearing the most remote resemblance to the parent form of *bethesba*. I have, however, reared a single specimen from these *bethesba* ova which strongly resembles the *hecabe* form of *T. multiformis*, and it is therefore probably a hybrid. The outline of the wing of *lata* is pointed, that of *bethesba* rounded, and the former is a much larger insect than the latter. I have proposed the name of *T. biformis* to unite these two forms. The form *lata* is only seven days in the pupa, but lives for eight months in the imago state, during which time it hibernates for from four to five months. I previously stated that *lata* appears from March to November; this I now see is an error, the reverse being nearer the truth. It appears last in the year in November–December, and emerges from its hibernation first in March. The *lata* form emerges during the first week of September, or, exceptionally, during the last few days of August, from ova laid by the *bethesba* form in August, taking a remarkably short time to complete its metamorphosis. The *lata* form does not commence to hibernate before November, and continues in hibernation until the first warm days in March awaken it. Specimens may be seen flying about until May, when the females deposit their ova which produce the *bethesba* form in July."

In the autumn of 1887 I was in South Kashmir, where I met with *lata* and a form which I am quite unable to separate from *bethesba*. Probably the *bethesba*-like specimens were late examples of the summer brood of *lata*,

whilst those of the typical form of the species may have been early examples of the autumn brood.

This species is common in China, Japan, Southern Corea, and the Himalayas, occurring up to 9000 feet.

Terias hecabe.

Papilio hecabe, Linnæus, Syst. Nat. i. 2, p. 763 (1767).

Terias hecabe, Moore, Lep. Ceyl. i. p. 118, pl. xlv. figs. 1 *a*, *b*, *c* (1881); Distant, Rhop.

Malay. p. 304, pl. xxvi. fig. 19 ♂ (1885).

Terias sinensis, Lucas, Rev. Zool. (2) iv. p. 129 (1852).

Terias anemone, Felder, Wien. ent. Mon. vi. p. 23 (1862); Butler, Trans. Ent. Soc.

Lond. 1880, p. 199, pl. vii. figs. 9-11.

Terias mandarina, De l'Orza, Lep. Jap. p. 18 (1839); Butler, l. c. p. 199, figs. 13-18.

Terias muriesii, Butler, Trans. Ent. Soc. Lond. 1880, p. 198, pl. vii. figs. 1-7.

Terias hybrida, Butler, l. c. p. 159.

Terias conuexica, Butler, l. c. p. 199, fig. 12.

Terias multiformis, Pryer, Rhop. Nihon. p. 8, pl. ii. figs. 9 *a*, *b* (1886).

“*P. D.* alis integerrimis rotundatis flavis extimo nigris; singulis subtus punctis pallidis numerosissimis.” (*Linnæus*, l. c.)

Sinensis, Lucas.—“*Enverg.* 39 millim. *Mâle*. Il a beaucoup d'analogie avec le *T. hecabe*, tout près duquel il vient se ranger. Les ailes sont d'un jaune pâle. Les supérieures ont une bordure noire plus large et moins foncée que dans le *T. hecabe*, denticulée intérieurement, avec le sinus quadrangulaire moins bien formé et plus étroit; de plus, cette bordure s'unit vers l'angle interne, comme dans le *T. tilaha*, à une bande longitudinale pareillement noire, assez large, mais qui ne longe pas tout le bord interne, comme cela a lieu pour cette espèce. Les ailes inférieures ont une bordure noire beaucoup plus large que dans les *T. hecabe* et *tilaha*, avec son côté interne obscurément denticulé. Toutes les ailes, en dessous, sont d'un jaune un peu plus pâle qu'en dessus, avec une rangée marginale de petits points noirs très faiblement accusés près de la frange; de plus, ses ailes ne présentent ni dessins ni taches, ce qui n'a pas lieu pour les *T. hecabe* et *tilaha*. Les palpes sont revêtus de poils jaunes; la tête est couverte de poils jaunes, parmi lesquels on en aperçoit d'autres qui sont noirs; les antennes sont noires, annelées de blanc; le thorax est noir, avec les parties latérales du sternum jaunes; l'abdomen est noir en dessus et jaune sur les côtés et en dessous.

“*F. mâle*. Elle est un peu plus petite que le *mâle*, d'un jaune moins foncé, et finement saupoudrée d'atomes noirâtres. La bordure noire des premières ailes est aussi large que dans le mâle, avec le sinus triangulaire mieux formé et finissant plus carrément à l'angle interne que dans le *T. hecabe*; de plus le bord interne n'est pas marginé de noir comme dans le *mâle*; la bordure noire des ailes inférieures est un peu plus étroite, moins fortement accusée, surtout près de l'angle anal, et très vaguement denticulée à son côté interne; en dessous, elles ressemblent à celles du mâle.

“ Cette espèce habite la Chine, où elle a été découverte par M. Callery.” (*Lucas*, l. c.)

Anemone, Felder.—“Alis sulphureo-flavis, antice supra extimo marginique postico introrsum parum sinuato fuscis, posticis utrinque punctis marginalibus nigris apud venarum extima, subtus annulis nonnullis obsolete brunneis. ♂.”

“In regionibus montosis circa Ning-po. Minor quam *T. hecabe*, Linn., cui accedit. Facile distinguitur formatione limbi fusci alarum anticarum et absentia marginis fusci in alis posticis.” (*Felder, l. c.*)

Mandarina, De l'Orza.—“Abe flavæ: antice subtruncate, apice vix nigro strigate; subtus obsolete fusco ocellata.

“Cette *Terias* est de la taille de l'*hecabe*: ses quatre ailes sont d'un jaune citron sans taches; seulement les supérieures, dont l'extrémité est un peu tronquée, offrent ordinairement au sommet quelques petits traits, très peu prononcés, d'un gris noirâtre; le dessous des quatre ailes est également d'un jaune citron, avec une lunule brunâtre un peu obsolète, ocellée de jaune. On voit en outre, entre la base et la lunule centrale de chaque aile, quelques points noirâtres obsolètes et pupillés de jaune pour la plupart.

“La femelle, dont nous n'avons vu qu'un seul exemplaire, est presque d'un jaune soufre. Pour le reste, elle offre les mêmes caractères que le mâle.

“Nous ne savons pas de quelle partie du Japon proviennent les individus qui ont figuré à l'Exposition.” (*de l'Orza, l. c.*)

Var. *mariesii*, Butler. “*a*. Male only differs from *T. hecabe* in its brilliant lemon-yellow instead of dark gamboge-yellow colouring. In this respect it shows no variation. The female is of a sulphur-yellow colour, and is extremely rare.

“*b*. Rather larger than the type, the border of the secondaries of about half the width, and emitting short black spurs upon the veins.

“*c*. The border of the primaries slightly narrower, especially near the external angle, the outer border of the secondaries inconstant, the under surface with the ordinary markings feebly indicated.

“*d*. Like the type form (*a*), excepting that the black border of the primaries is of little more than half the width at external angle; size very variable.

“*e*. Similar to the preceding, but with narrower border to the secondaries.

“*f*. Similar to *e*, excepting that the border of the primaries is distinctly narrower towards the external angle, and the border towards the costa not angulated.

“The form which follows this appears to be a hybrid between *T. mariesii* and *T. anemone*, and therefore may be provisionally named

Var. *hybrida*, Butler. “The outer border of the primaries rather wider throughout than in *T. anemone*, the inner margin exhibiting from eight to nine fairly regular sinuations, of which the two on the median interspaces are broader but scarcely less prominent than the others, the costal margin more or less bordered by a narrow black band; secondaries with the outer border varying from a narrow band to a series of dots; size variable.” (*Butler, l. c.*)

Var. *connexiva*, Butler. “The outer border almost reduced to a sinuated line towards external angle, but the apical portion with an inward angulation, as in the darkest forms of *T. mandarina*; the length of the apical patch variable; in one out of our three examples it is as short as in *T. mandarina*; one of the specimens with the short apical patch has the oblique dash characteristic of *T. mandarina* on the under surface of the primaries; size variable.

“I have little doubt that this is a hybrid between *T. anemone* and *T. mandarina*.” (*Butler, l. c.*)

An exceedingly variable species. Some specimens are absolutely devoid of markings on the upper surface in both sexes, and from such examples to others in which all the wings are heavily bordered with black there are all intermediate gradations. The male ranges in colour from a very pale citron to orange, and some females are much suffused with blackish scales. Some specimens are almost immaculate on the under surface, whilst others are heavily marked with dark brown. The males range from 30-59 millim., and the females from 38-59 millim. in expanse. Probably no other butterfly has received so many names as *T. hecabe*; but confining my remarks to such forms as have been named and described from the region dealt with here, I may say that an examination of an extensive series such as the one before me, selected from an enormous number received by me from China and Japan, which includes all the forms enumerated above, together with intermediate forms, should prove, even if the fact had not been ascertained by breeding-experiments, that all the specimens are referable to one species.

Pryer states that the *mandarina* form is on the wing in the autumn, and again, after hibernation, in the spring, when the females deposit their eggs upon *Lеспеdса juncea*, and it is from these eggs that *hecabe*, the summer form, is produced. The same writer says:—"By placing half of a brood of larvæ in a cool place and half in a warm one, I have simultaneously produced a mixture of the two forms, some perfect *hecabe* (hot), and some *mandarina* (cold), at a time of year when naturally only *hecabe* is found. . . . *mandarina* appears on the cold mountains much earlier than on the plains, and these fly down and mix with *hecabe*, producing one or more broods late in the autumn, of numberless intermediate varieties, showing all transitions between the two parent forms." With reference to the apparent disproportion of the sexes of the *hecabe* form, Pryer writes:—"The males are fond of settling in numbers on damp spots in pathways, or flying about in the open, and are easily captured in large numbers. The females have to be sought after among the herbage and undergrowth, and are much less easily found."

The larva and pupa of *T. hecabe*, from Java, are figured by Horsfield (Cat. Lep. E. I. C. pl. i. figs. 11, 11 a), who states that the larvæ are found abundantly from January to April feeding on *Æschynomene sesban*. Distant, quoting from Dr. Thwaites and Mr. Mackwood, gives *Leguminosæ* and the "Madras thorn" as food-plants.

Common throughout Japan, excepting the island of Yezzo. Obtained in all parts of China visited by my collectors, and recorded from S.E. Corea.

Distribution. India and all the warmer parts of Asia.

Genus COLIAS.

Colias, Boisduval, Sp. Gén. i. p. 633 (1836); Doubleday, Gen. Diurn. Lep. i. p. 72 (1847).

“HEAD moderately broad, clothed with rather long hairs.

“*Eyes* oval, prominent.

“*Labial palpi* longer than the head; clothed with scales, and in front with appressed hairs. First joint curved; second cylindrical, about equal in length to the first; third joint minute.

“*Antennae* short, rather stout, generally thickening to the apex, which is truncate.

“THORAX stout, clothed in front densely with fine hair.

“*Anterior wings* subtriangular; the apex sometimes, though rarely, acuminate, or almost falcate; the costa sometimes slightly sinuate. Costal nervure very stout. Subcostal four-branched; its first nervule thrown off about the middle of the cell; the second at, or near to, the end of the cell; the third, much nearer to the apex than to the end of the cell. First discoidal nervule united to the subcostal for a considerable distance beyond the cell. Lower discocellular nervule about twice the length of the middle discocellular.

“*Posterior wings* obovate, or subtriangular, with the angles rounded. Discoidal nervure appearing to be a third subcostal nervule.

“*Legs* moderately stout. Tarsi rather long, very spiny. Claws but little curved, deeply bifid, without paronychial or pulvilli.

“ABDOMEN of moderate size, not equal in length to the inner margin of the posterior wings.

“LARVA subcylindrical, but little smaller at the extremities, slightly pubescent.

“*Pupa* not arched, gibbous; the head abruptly pointed, the abdomen tapering gradually to a point, the back keeled.” (*Doubleday, l. c.*)

Colias hyale. (Plate XXXIV. figs. 1–14.)

Papilio hyale, Linnaeus, Syst. Nat. x. p. 469 (1758).

Colias hyale, Lang, Butt. Eur. p. 53, pl. xii. fig. 3 (1884); Pryer, Rhop. Nihon. p. 8, pl. ii. figs. 4a, 4b (1886).

Colias poliographus, Motschulsky, Etud. d'Entom. ix. p. 29 (1860).

Colias simoda, de l'Orza, Léop. Jap. p. 16 (1869).

Colias ueriana, Fischer, Motsch. l. c.

Colias erate, Murray, Ent. Mo. Mag. xiii. p. 34 (1876).

Colias subaurata, Butler, Ann. & Mag. Nat. Hist. (5) vii. p. 138 (1881).

Colias chuesii, Butler, l. c.

Colias pallens, Butler, Journ. Linn. Soc., Zool. ix. p. 52 (1866); Lep. Exot. p. 89, pl. xxxiv. fig. 3 (1872).

“ Expands on an average 1.75 in., sometimes reaching 2 in. Wings sulphur-yellow. Fore wings with a black discoidal spot, and a black hind-marginal band enclosing a row of conspicuous yellow spots, and ending rather abruptly, so as not to reach the inner margin; as it approaches the latter it gradually becomes narrower, being widest at the costa. Hind wings yellow, blackish at the base: faint traces of a black band are seen on the anterior part of the hind margin, and there is a large discoidal spot of a bright orange colour. The female exhibits the dimorphism so common in this genus, often having the wings nearly white, instead of yellow. Underside: fore wings yellow, darker at the apices; a row of five or six black spots runs parallel to the hind margin; the discoidal spot is black. Hind wings deeper yellow, with a large pearly discoidal spot surrounded by a dull red ring, and having a smaller spot similar in character placed above it. At the base of the wing is a dull red mark. Parallel to the hind margin is a row of dull red crescentic spots, with their concave sides outwards, and a conspicuous narrow reddish spot on the costa. Head, prothorax, antennæ, and legs dull red; fringes of hind margins pink.

“ *Larva*. Cylindrical, dark green, sprinkled over with black dots; there is a narrow yellow and white lateral stripe. Feeds on *Leguminosæ*, principally *Trifolium*, the eggs being laid in the spring by hibernated females.

“ The *pupa* is green, with a brownish-yellow lateral stripe.” (*Lang, l. c.*)

Var. **poliographus**, Motschulsky. “ *Figura tantum Col. h. juli, sed alis anticis supra: apice magis elongatis, magis rotundatis, macula laterali intus distincto angulata, subtus: maculis lateralibus oblitteratis, postice solum duabus utrinque distinctis; alis posticis: immaculatis, medio puncto argenteo uno.*

“ Exp. al. 18 l.” (*Motschulsky, l. c.*)

Var. **simoda**, de l'Orza. “ *Alæ integræ rotundatæ, supra vivide sulphurææ: anticarum limbo nigro flavo maculato, utrinque puncto medio nigro: posticæ subtus puncto sesquialtero argenteo.*

“ Elle est un peu plus grande que la *h. juli*, dont elle a la port; le dessus de ses quatre ailes est d'un joli jaune-soufre; celui des supérieures est marqué d'un gros point noir sous-costal, comme dans les espèces du même groupe, et offre à l'extrémité une large bande noirâtre, sinuée en dedans, divisée dans le mâle par deux taches de la couleur du fond et dans la femelle par une rangée de taches semblables, mais au nombre de cinq à six. Les ailes inférieures offrent sur le milieu un gros point orangé et à l'extrémité une bordure noirâtre crénelée; le dessous ressemble à celui de toutes les espèces voisines, mais le point central des ailes supérieures est fortement ocellé.

“ On ne confondra pas cette espèce avec la *ariciæ*, dont le mâle n'a jamais la bordure divisée par des taches jaunes.

“ Il ne serait pas impossible que l'individu que nous regardons comme la femelle de la *milluicis* ne fût qu'une variété blanche de cette espèce.

“ Cette Coliade, très voisine de notre *hyalæ*, paraît être commune au Japon.” (*de l'Orza, l. c.*)

Var. **elwesi**, Butler. “ *Male*. Above lemon-yellow, the basal three sevenths and costal border of primaries densely irrorated with greenish grey; basal fourth of costal margin ferruginous; apical area (from apical two fifths of costa to external third of third median branch) and a

broad external border, sinuated in second median interspace and at external angle, black; a subapical series of irregular yellow spots, a large broad lunate spot on the border in the first median interspace and a small spot below it yellow; a large black discocellular spot; secondaries irrorated with grey; a submarginal series of large subconfluent sulphur-yellow spots, bounded internally towards the costa by a few blackish scales; apical border and three large spots at the extremities of the radial and second and third median branches black; fringe varied with rose-colour; a large bright orange spot at the end of the cell; body normal. Under surface lemon-yellow, the characters of the upper surface indistinctly traceable through the texture of the wing, costal margins and fringes rose-coloured; primaries with a diamond-shaped silver-centred black discocellular spot; three squamose blackish spots parallel to the outer margin on the median and internomian interspaces; secondaries with an ochreous-bordered purple-edged silver spot at the end of the cell; a discal arched series of purplish-red dots commencing with an angular spot of the same colour upon the costa; body whitish, legs rosy. Expanse of wings 2 inches 8 lines.

"*Female*. Above like the male, excepting that all the submarginal lemon-yellow spots of the secondaries are bounded internally by blackish scales, which, however, get less distinct towards the abdominal area; below with rather brighter primaries, the three discal spots larger, brown, and the series continued by two smaller brown spots or dots on the radial interspaces and two costal spots, the secondaries with a small additional silver-centred spot above the one at the end of the cell; otherwise exactly like the male.

"*Albino female*. Above creamy white, the basal area and costal border of primaries and the secondaries bluish grey; the spots on the border smaller than in the male, the discocellular spot larger; the marginal spots of secondaries diffused and subconfluent, the first being confluent with the apical border; the submarginal spots only slightly paler than the ground-colour, smaller than in the ordinary form, the first two bounded internally by large black lunate spots, the others by a few blackish scales; orange spot very pale. Primaries below white, with greyish basal area, the discal series of spots completed, beginning in the internomian and median interspaces with three decreasing triangular black spots, after which they are small and red-brown; apical area greenish sulphur-yellow, brighter at outer margin; costal margin and fringe rose-red; secondaries green, washed with yellow towards the base, fringe rose-red; markings as in the ordinary female. Expanse of wings 2 inches 8 lines.

"This is a tolerably common species, allied to *C. sinola*, but differing constantly from that form in the greater length of the costal margin of the primaries, the larger pale submarginal spots, with less defined internal limiting spots on the secondaries, the maculated character of the border on these wings, the noticeably paler colour of the under surface, the increased number of the discal spots on the under surface of the females, and the greater size of the albino females." (*Butler, l. c.*)

Var. **subaurata**, Butler. "*Male*. Above very similar in coloration and pattern to the preceding species [var. *lucasi*], but with distinct depressed marginal triangular yellow spots, and the wings less irrorated with grey; the secondaries also without paler submarginal spots, but with a zigzag black line on and between the veins towards the apex; no distinct apical border, but six large marginal black spots. Below the wings are bright golden orange or very bright ochreous yellow, with the inner border of the primaries lemon-yellow; three large black discal spots (as in the preceding species), two blackish dots on the radial interspaces, and two brownish dots on the costa; a black discocellular spot, with a yellow pupil; costal

margin and fringe rose-red: secondaries with costal margin and fringe as in the primaries; a discal arched series of indistinct plum-coloured dots, beginning on the costa with a spot of this colour; a silver spot at the end of the cell with plum-coloured margin and orange zone, and above it a similar but very minute and fusiform spot; venter somewhat whitish, legs rosy. Expanse of wings 2 inches 2 lines.

"*Female*. Larger than the male; the basal area more densely irrorated with greenish grey; secondaries densely irrorated with greenish grey, the orange spot very large and dark; marginal black spots diffused inwardly, the first two confluent; a submarginal series of irregular yellow spots bounded internally by an arched series of heavy black lunules. Under surface exactly as in the male. Expanse of wings 2 inches 8 lines.

"*Albino female*. Above with the ground-colour creamy white, the primaries bluish grey towards the base; marginal spots obsolete, otherwise as in the ordinary form; secondaries densely irrorated with grey, hardly greenish, the marginal black spots united into a border, the submarginal spots fairly regular, internally bounded by blackish spots, but only very distinctly towards the costa; orange spot rather paler than in the ordinary female. Primaries below with only the apical area and a suffusion over the discoidal area of the same golden ochreous colour as in the male; the rest of the primaries creamy white, but with the usual markings; costal margin and fringe red; secondaries as in the ordinary form, excepting that the discal dots are larger. Expanse of wings 2 inches 5 lines.

"This is a fairly common species, which may be readily distinguished by the deep coloration of the under surface." (*Butler, l.c.*)

Var. **pallens**, Butler. "Ate supra fulvæ, ciliis rufis; antice pallidæ, elongatæ, angustæ, cella macula nigra terminante, apice cinereo, maculis duabus pallidis subapicalibus; margine postico pallido cinereo, postice cinereo orate, basi nigrescentes, margine apicali fusco, apud angulum analem pallente maculas quatuor fulvas includente; cella macula flavâ terminante; corpus cinereum, præ rubescens, antennis rufis. *Ab. antice* subtus fulvæ, margine interiore pallido, apice flavo, margine anali punctis tribus nigris submarginato; cella macula terminante. *Ab. postice* flavæ, valde cinereo orate, costa post cellam macula rufo-fusca; cella macula argentea terminante, fusco bicincta punctoque fusco præposito.

"*Cocpus* flavum, abdomine pallido. *Alar. exp.* unc. 1 $\frac{3}{16}$."

"Allied to *Colias hyale*, from which it chiefly differs in its smaller size, elongated narrow front wings, and pale submarginal markings." (*Butler, J. L. S.*)

Several interesting specimens are figured on Plate XXXIV. Of these figs. 8 & 9 show the largest and smallest examples I have, so far, seen of this species; the former is from Chia-ting-fu, and the latter from Ichang.

C. hyale from Eastern Asia ranges in colour in the male from pale whitish yellow (fig. 7) to canary yellow (fig. 8), and the black markings graduate between the two extreme examples represented by figures 1, Chang-yang, and 4, Japan. In several specimens the black markings on the secondaries are reduced to almost vanishing point (fig. 7). The orange central spot of secondaries is also subject to considerable modification, and may be well developed (fig. 8), faintly defined (fig. 7), or entirely absent; variation in this

character appears to be more frequent in the male, but is quite independent of change in the other markings. In some specimens the black discoidal spot of primaries is sprinkled with orange scales (fig. 6, Japan), in one example, also from Japan, the discoidal spot is dingy orange sparsely scaled with black, and in a specimen from Chia-ting-fu this spot on left fore wing has the lower portion orange, as on secondaries, and the upper portion black.

Two females from Japan and one from Chang-yang are suffused with orange (fig. 11, Japan); other forms of the female are represented by figures 5, 12, and 13. The yellowish suffused specimen from China might be considered as a hybrid between *C. hyale* and *C. fieldii*, but there is no possibility that the Japanese examples of the same form could be hybrids, as *C. fieldii* does not occur in that country.

Elwesi is a large pale form of *C. hyale* commonly found in Japan. *Palleus*, on the other hand, is a small form of the species, the type of which, in the National Collection, has the apical markings of primaries and those on outer margin of secondaries paler than Butler's figure (Lep. Exot. xxxiv. fig. 3); I have a similar specimen from Hakodate and others from Japan which are intermediate between it and typical *hyale*.

Poliographus and *simoda* are identical forms, and do not differ in any marked manner from *elwesi*. *Subaurata* has the under surface rather orange, as is not infrequently the case in specimens of *hyale* from Eastern Asia, but does not differ in any important particular from typical *hyale*. None of these names appear to me worth retaining, as the forms to which they apply are certainly not constant, neither are they peculiar to any district or locality. I may mention that in 1886 I found *poliographus*, *subaurata*, and *elwesi* together in one spot near Nagahama, and of six pairs which I took *in copula*, only two pairs were of the same form in both sexes.

Pryer (*l. c.*) observes of this species that it is "one of the most abundant butterflies about Yokohama, and is the first harbinger of spring. It may often be seen flying about a warm sunny bank by the middle of February, when the snow is still on the ground. These are not hibernated specimens, but freshly emerged, as I have often taken them then with their wings hardly dry. . . . The difference between a summer and a winter specimen is most marked, both in colour and size."

Some of the specimens from China agree almost exactly with certain examples of *C. crate* from Russia in my collection, and I am quite inclined

to concur with Mr. Elwes, who, in discussing *C. hyale* and *C. erate* in his paper on the genus *Colias* (Trans. Ent. Soc. Lond. 1884), says:—"I am quite unable to say how these two species can be in all cases distinguished from each other, and, though pages might be written on the subject of their varieties, yet I doubt whether anything certain could be made out, except by breeding on a large scale, and in different parts of the world."

There was a partially gynandrous specimen in Pryer's collection which was taken in Japan, but the exact locality is not stated. It is a male with the colour of the pallid female, and a broad longitudinal streak of the normal male colour through the secondaries (Plate XXXIV. fig. 14).

Distribution. Europe, North Africa, Asia Minor, Russia, Central Asia, Amurland, Askold, Japan, Corea, China, and India.

Colias montium. (Plate XXXIV. fig. 15 ♀.)

Colias montium, Oberthür, Etud. d'Entom. xi. p. 16, pl. vi. fig. 41 (1886).

"Voisine de *phicomone*, dont elle a tout à fait le faciès, mais dont elle diffère par la couleur jaune canari du disque des ailes supérieures en dessus, sans semis d'atomes noirs, et par la teinte jaune plus foncé du dessous des ailes inférieures. Elle ressemble aussi à *alpherakyi* mais elle n'a pas la même forme d'ailes; de plus la teinte générale est beaucoup moins verdâtre tant en dessus qu'en dessous, et la frange et les antennes sont roses, comme dans *phicomone*."

"La *Colias montium* ne peut être confondue avec *nilaghiricensis*, Felder, des monts Neelgherries, dans le sud de l'Indoustan. Cette *Colias* indienne, dont M. le R. P. Castets, de Trichinopoly, nous a transmis de nombreux exemplaires très frais, a l'apex des ailes supérieures bien plus largement empaté de noir et la couleur jaune verdâtre du dessus des quatre ailes beaucoup plus vive. Cette *Colias nilaghiricensis* nous paraît du reste être une espèce parfaitement distincte appartenant au groupe de *hyale*." (Oberthür, l. c.)

Male. Pale greenish yellow. Primaries have a broad black border on outer margin traversed by a series of spots of the ground-colour as in *C. ladakensis*, Felder*, but the fifth spot of the series is generally absent, and when present is very small. Secondaries are blackish with a large pale greenish-yellow discoidal spot and a broad border of the same colour on outer margin less distinctly interrupted by the nervules than in *C. ladakensis*. Under surface of primaries pale greenish yellow, more yellowish on the apical area, and powdered with blackish scales on the basal and central portions of these wings; the discoidal spot is black with a small white centre, and there is a black spot in the median and submedian interspaces; secondaries greenish, merging into yellowish towards costa, the outer margin has a broad greenish suffused yellowish border; discoidal spot silvery white, surrounded with reddish brown, and there is a spot of the latter colour on the costa.

Female. Rather larger than the male; the ground-colour is paler and more suffused with black. Expanse 48-50 millim.

I have received a long series of this species taken at a great elevation in

* Reise Nov., Lep. ii. p. 197, pl. xxvii. figs. 8, 9 (1865).

the neighbourhood of Ta-chien-lu. M. Grun-Grshimailo met with specimens in the Tetung Mountains, N.E. Thibet, and these do not differ from my Ta-chien-lu examples.

Colias palæno.

Papilio palæno, Linnaeus, Syst. Nat. i. 2, p. 764 (1767).

Colias palæno, Lang, Butt. Eur. p. 49, pl. xi, fig. 1 (1884); Pryer, Rhop. Nihon. p. 7, pl. ii, fig. 3 (1886).

“ Expands from 1.75 to 2.70 inch. Wings of the male pale yellow, with a black border, dusted over, and sometimes finely veined, with pale yellow; the fore wings have a small black discoidal spot, sometimes this is altogether wanting; the hind wings have a very faint and hardly visible pale spot touching the discoidal cell. Underside: fore wings deeper yellow than above; the black border of the upperside shows through, giving a darker shade to the hind margin; discoidal spot small and nearly annular. Hind wings greenish yellow with a small pearly discoidal spot. The head, antennæ, and other appendages, as well as the prothorax and legs, are red; the meso- and metathoracic segments are black, as well as the abdomen, and are covered with white downy hairs. The margins of all the wings are fringed with rosy red, except at the anterior part of the hind margins of the hind wings, where the fringe is pale yellow. The female has the wings pale greenish white, instead of yellow; the black border is less sharply defined internally than in the male.

“ *Larva* green, dotted with black, and having stripes of yellow.

“ The female of this species is, like most of those of the genus, dimorphic, but it departs from the general rule in having the normal form white, as described above. There is, however, a yellow form [var. *verdandi*, Herr.-Schäff.], which is found in the higher Alps, and may possibly represent the original appearance of the insect.” (*Lang, l. c.*)

Pryer states that this species occurs in Japan at an elevation of over 6000 feet. He adds:—“ I have seen it commonly at the Yu-no-taira on Asama-Yama. Owing to the irregular nature of the ground, which is composed of loose volcanic scoriæ, it is most difficult to capture. It never seems able to stray far from this place, and may be seen beating up and down, but never descending below this bleak and cold locality.”

Mr. Fenton says:—“ I had great trouble in capturing two couples on the side of a barren volcanic mountain covered with scanty grass, low herbs, and wind-dwarfed pines, at an elevation of about 7000 feet above sea-level (registered by a pocket aneroid).”

Japanese examples agree with those from Switzerland, as also do Amurland specimens.

Distribution. Scandinavia, Russia, Lapland, Switzerland, Tyrol, Pyrenees, Amurland, Japan.

Colias fieldii. (Plate XXXV. figs. 6 ♂, 7 ♀.)

Colias fieldii, Ménétriés, Cat. Mus. Petr. i. p. 79, pl. i. fig. 5 (1855).

"Cette *Colias* est intermédiaire entre la *C. myrmidonæ* et l'*Edusa*; les ailes supérieures sont en dessus de la même teinte jaune de la *myrmidonæ*, et leur dessin se distingue seulement de celui de l'*Edusa* en ce que la base est plus largement noire, et le point discoïdal est plus gros, surtout en dessous où il offre au milieu une pupille quelquefois double, d'un beau blanc. Les ailes inférieures sont semblables à celles de la *myrmidonæ*, mais en dessus, la bordure noire est un peu plus large sur le bord externe, la base est plus fortement saupoudrée de noir, et non loin de la base, sur le bord antérieur, est une tache d'un jaune moins rougeâtre que la teinte générale de l'aile; cette tache est limitée par la bordure noire externe, qui d'abord étroite, remonte en s'élargissant jusqu'à cette tache jaune, qu'elle rejoint par des atomes noirs et serrés; ces ailes en dessous ressemblent complètement à celles de l'*Edusa*. Un exemplaire mâle de moitié plus petit, ne m'a rien offert de particulier, et je l'eusse confondu volontiers avec une *Edusa*, si je n'eus aperçu la tache jaune de la base du bord antérieur des secondes ailes.

"Cette espèce vient des Monts Himalaya, et nous a été donnée par M. Field, qui s'occupe d'histoire naturelle." (*Ménétriés, l. c.*)

Agrees in colour with *C. myrmidonæ*. Esper, but the markings are almost exactly like those of *C. edusa*, Fabricius; the fringes of primaries, however, are rarely chequered, the black discoïdal spot is generally larger, and the black border of secondaries is continued along the costa of these wings to the base. On the under surface the black discoïdal spot of primaries is always centred with silvery white, and the outer edge of the purplish-brown patch upon which the discoïdal spots of secondaries are placed is acutely produced.

Expanse. ♂ 48-66 millim., ♀ 49-72 millim.

Common and widely distributed in Central and Western China.

As a rule the males from China are larger and brighter-coloured than Himalayan examples of the same sex, and the discoïdal spot on primaries is of greater size. The females are very variable in colour, some being a pale yellow, and others a bright orange; the pale submarginal spots may be either well-defined or almost absent.

C. fieldii is very abundant in the North-west Himalayas throughout the summer. It is common in Sikkim, and flies at an elevation of over 6000 feet. I took a white female specimen of this species in Kashmir; this form, which corresponds to *C. edusa*, var. *helice*, is exceedingly rare, and I have not received a single example of it among the large number of *C. fieldii* sent to me from China.

M. Grun-Grshimailo obtained specimens in the Nian-shan Mountains, Thibet.

Distribution. Himalayas, Thibet, Central and Western China.

Genus GONEPTERYX.

Gonepteryx, Leach, Edinb. Enc. ix. p. 128 (1810); Doubleday, Gen. Diurn. Lep. i. p. 69 (1847).

Rhodocera, Boisd. Lec. Lep. Amer. Sept. p. 70 (1833); Sp. Gén. i. p. 597 (1836).

“HEAD broad, densely clothed with erect hairs.

“*Eyes* round, rather prominent.

“*Labial palpi* longer than the head, clothed with short scales. The first joint curved, compressed internally; second joint at least half as long as the first, subcylindric, tapering, or elongate-oval, compressed internally; third joint minute, rounded or oval, placed a little below the apex of the second.

“*Antennæ* short, stout, mostly channelled below, gradually thickened towards the apex, which is truncate.

“THORAX stout, clothed with fine hair.

“*Anterior wings* subtriangular, mostly falcate at the apex; the costa much curved near the base. The costal nervure stout; subcostal four-branched; its first nervule thrown off about the middle of the cell, the second just before the end of the cell, the third about midway between the end of the cell and the apex of the wing. First discoidal nervule united to the subcostal for some distance beyond the cell, middle disco-cellular less than half the length of the lower. Submedian nervure curved downwards near the base. Internal nervure short, running into the submedian.

“*Posterior wings* mostly angular, sometimes obovate. Precoastal nervule simple, mostly merely rudimentary. Discoidal nervure appearing to be a third subcostal nervule. Abdominal channel very distinct and ample.

“*Legs* rather short. Claws deeply bifid. Paronychia about as long as the claws. Pulvillus sometimes wanting.

“ABDOMEN rather stout, not so long as the abdominal margin of the posterior wings.

“LARVA tapering considerably at both extremities, thinly covered with fine hair; the back and sides shagreened.

“*Pupa* very pointed at both extremities; thoracic segments swollen.” (*Doubleday, l. c.*)

***Gonepteryx rhamni*.** (Plate XXXV. fig. 4. var.)

Papilio rhamni, Linnaeus, Syst. Nat. i. 2, p. 765 (1767).

Rhodocera rhamni, Boisduval, Sp. Gén. i. p. 602, pl. vi. fig. 7 (1836).

Gonepteryx rhamni, Lang, Butt. Eur. p. 65, pl. xiv. fig. 4 (1884).

Rhodocera amintha, Blanchard, Compt. Rend. 1871, p. 810, note.

Gonepteryx maxima, Butler, Ann. & Mag. Nat. Hist. (5) xv. p. 107 (1885).

Rhodocera maxima, Pryer, Rhop. Nihon. p. 7, pl. ii. fig. 5 (1886).

Gonepteryx rhamni, var. *annurensis*, Graeser, Berl. ent. Zeit. 1888, p. 69.

“Expands from 2.25 to 2.50 inch. The male has all the wings with a sharply projecting angle and of a bright greenish-yellow colour, with an orange discoidal spot on each wing. Under-

side yellower; the hind wings have the discoidal spot pearly in the centre. The female is somewhat larger than the male, and of a lighter colour, being whitish, but otherwise resembling it. Head and antennæ dull red; body black, covered with white silky hairs; legs light yellow.

- “*Larva* cylindrical, or rather slightly thicker in the middle segments than at the extremities; it is of a dull apple-green, covered with minute excrescences, from each of which grows a minute white hair. A lateral white waved stripe runs through the whole length of the body.
- “*Pupa* bright green, pointed at both ends, thicker in the dorsal thoracic region, the wing-cases forming a considerable round-shaped projection; the cephalic and thoracic parts are shaded with purplish brown.
- “Food-plants, *Rhynchos frangula* and *R. catharticus*. The eggs are laid by hibernated females in April; the larva emerges early in May, and is full grown by the end of June, the imago appearing towards the end of July at the earliest.” (*Loag, l. c.*)

A complete life-history of this species will be found in Buckler's 'Larvæ of British Butterflies,' pp. 145-148, pl. i.

Var. **amintha**, Blanchard* = var. *maxima*, Butler. "The primaries well produced at apex as in *G. aspasia*; the primaries of male not quite so deeply coloured as in that species, though much more so than in *nepalensis*; the primaries a little deeper coloured than the secondaries and with confluent red brown marginal spots (as in *nepalensis*), a character not found in *G. aspasia*; orange spot of secondaries nearly as large as in *carinipennis*; costal area of primaries and whole of secondaries below greenish white; female greenish white, uniformly coloured. Expanse of wings 78 millim.

“♂. Nikko; ♀. N. China.

“From *nepalensis*†, to which this species is most nearly allied, it differs in its decidedly darker primaries, its more falcate, more elongated, and altogether larger wings, and the (consequently) larger orange spots on the wings, also in the less sinuous outer margin of the secondaries; from *G. aspasia*, to which most of these very characters prove its affinity, it differs in its slightly paler primaries and darker secondaries; the brown edging to the wings and the distinct separation of the under surface into two colours, as in the *G. rhamani* group.” (*Butler, l. c.*)

This species is common throughout Japan, Corea, and all parts of China visited by my collectors. It also occurs in the Loochoo Islands.

Maxima is the usual form met with; but some of the specimens from Western China are not distinguishable from examples of *nepalensis* from the North-west Himalayas in my collection, and others approach exceedingly

* “*Rhodocera amintha*, d'un tiers plus grand que le *Rhodocera rhamani*, les ailes ayant les angles médiocres et une tache centrale fauve très-marquée.” (*Blanchard, l. c.*)

† *Nepalensis*, Gray, is described by Butler (*l. c.*) as follows:—“Wings of both sexes with well-defined, partly confluent, marginal brown points; upper surface of male gamboge-yellow, of female creamy white, hardly greenish, even on the secondaries; wings below with costal area of primaries and whole of secondaries whitish.”

close to European examples of the species. The chief characteristic of all eastern forms of *rhanni* appears to be that the subcostal nervure of secondaries is straight, very conspicuous, and does not become attenuated until it almost reaches the outer margin, whereas in the western representatives of the species this vein tapers off some distance from the outer margin. The deepest-coloured specimens from China are the least angulated, and this is also the case in var. *cleobule* from the Canaries.

Three female specimens from Wa-shan and Chia-kou-ho, Western China, are of the usual male *rhanni* colour, and a gynandrous example from Wa-shan (Plate XXXV. fig. 4) has the right wings deeper in colour than in typical male *maxima*.

If Graeser had been acquainted with Butler's *maxima* he probably would not have described Amurland *G. rhanni* as var. *amurensis*. In his remarks on this form, he says:—"Herr Dieckmann has in his collection six males and four females from Thibet, which were received from Mr. Elwes as var. *nepalensis*, Doubleday. The males from Thibet have the same yellow colour as *rhanni* males, whereas the Amurland specimens have a much more intense yellow, the central area of primaries warmer in tone, and showing up distinct from the paler margins, and exhibiting in this respect some resemblance to *cleopatra* and *aspasia*; the red discal spots are large, and brighter than in the specimens from Thibet referred to above, and in shape the wings are nearer those of *cleopatra* than *nepalensis*."

Standinger (Rom. sur Lép. vi. p. 145) states that he possesses a male specimen of *nepalensis* from Simla that is almost identical with *amurensis*, and that of four males which were taken by Dörries in the Sutschan mountains one almost exactly agrees with typical *rhanni*, the only difference being that the orange discal spots are slightly larger and more brightly coloured. Also, he adds, from Central China, "I received under the name of var. *nepalensis* a specimen which comes very close to var. *amurensis*."

The following forms of *Gonepteryx*, viz. *farinosa*, Zeller; *cleopatra*, Linn.; *cleobule*, Hübner; *maderensis*, Felder; and *antonia*, Butler, are, I believe, all referable to one species, *i. e.* *G. rhanni*.

The most extreme form in intensity of colour is that known as *cleobule* from the Canary Isles; this has the primaries entirely orange, with the exception of an extremely narrow yellow border on outer margin; the extre-

mities of the nervules are strongly marked with reddish on all the wings, and the outer margins of the wings are only slightly angulated. The next form is *maderensis* from Madeira, which is similar in colour to *cleobule*, but the yellow border on outer margins of primaries is broader and more pronounced; I took specimens in South-western Morocco which are hardly separable from this form.

Cleopatra, common in Southern Europe and North Africa, has the orange colour confined to the central area of the primaries, and the space occupied by it is variable in extent; in some specimens the wings are very slightly angled, but I have several examples in my collection quite as much angled as in any typical *rhanni*. Instances of gynandromorphism are not infrequent in this form as well as in typical *rhanni*, and I have a male *rhanni* of the female coloration.

Antonia is a form occurring in Syria and Asia Minor. The orange patch on primaries is much paler than in *cleopatra*, and some specimens are hardly separable from typical *rhanni*.

Farinosa is larger and more densely clothed with scales than ordinary *rhanni*, and the outer margin is frequently indented as in *G. aspasia*.

The above remarks on the variation of *G. rhanni* are based on an examination of about 90 specimens from various parts of Europe, Asia Minor, Africa, Madeira, and the Canary Islands in my own collection.

Gonepteryx aspasia.

Gonepteryx aspasia, Ménétrics, Schrenck's Reis. p. 17, pl. i. fig. 6, ♂.

Gonepteryx aspasia, var. *acuminata*, Felder, Wien. ent. Mon. vi. p. 23 (1852).

Rhodocera acuminata, Pryer, Rhop. Nihon. p. 7, pl. ii. fig. 6 (1886).

? *Rhodocera alvinda*, Blanchard*, Compt. Rend. 1871, p. 810, note.

"*Mos*. Alis virescenti-albidis; anterioribus falcatis, disco citrino.

"Cette espèce se rapproche beaucoup des *G. rhanni* et *cleopatra*, mais j'ai cru trouver, d'après l'examen de 6 mâles et 2 femelles, des caractères constants capables d'établir une bonne

* *Rhodocera alvinda*, Blanchard, Compt. Rend. 1871, p. 810, note.

"Très voisin du *R. rhanni*, plus voisin du *R. aspasia*, du Ménétrics, des rives du fleuve Amour, ayant les ailes plus étroites avec la tache centrale fauve unie et nullement cernée." (Blanchard, l. c.)

As the above description is so very meagre it is not possible to say with certainty what it refers to, but I think the narrower wings point to its being a form of *aspasia*.

diagnose de cette espèce, ce qui me semble une raison de plus pour séparer la *rhamnii* de la *cleopatra*, et ainsi d'imiter MM. Herrich-Schäffer, Zeller, Lederer, etc., quant à ce que M. Standfuss, dans le 'Stettiner Zeitung,' 1857, les réunisse de nouveau, cela est peu important, puisque cet auteur ne nous donne pas de bonnes raisons.

- " Je comparerai cette espèce avec la *G. rhamnii* avec laquelle elle offre le plus de rapprochements : elle s'éloigne encore davantage de la *R. farinosa*, Zell. Isis, 1847, p. 5, par la coupe des ailes. Les ailes supérieures offrent à leur bord antérieur et près du sommet une plus forte convexité, laquelle se prolonge en une pointe plus longue et plus aigüe; le bord externe est fortement échancré et l'angle interne largement arrondi; les ailes inférieures présentent au contraire l'espace du bord externe compris entre l'angle externe et l'angle interne, arrondi environ en quart de cercle, ainsi moins proéminent que chez la *rhamnii* et la *cleopatra*, vu que ce bord est moins échancré près du prolongement de l'angle interne. En comparant la disposition des nervures des ailes inférieures de ces trois espèces, j'ai trouvé chez cette nouvelle deux caractères qui la distingueraient des deux espèces européennes : 1, l'espace entre le pli intermédiaire et sous-médian est plus étroit et plus parallèle chez notre espèce; 2, la nervure de la cellule discoidale qui rattache la nervure sous-costale avec la 1^{re} supérieure, est plus courte chez cette nouvelle espèce.
- " Le mâle en dessus est d'un blanc verdâtre à peu près comme chez la femelle du *rhamnii*, mais les ailes supérieures présentent le disque, y compris la base, d'un jaune citron, absolument de la même manière que la teinte orangée recouvre les ailes supérieures des mâles de la *cleopatra*; vers le milieu de chaque aile se voit un petit point orange.
- " En dessous, le mâle est d'une teinte un peu plus jaune que celle qui orne la femelle de la *rhamnii*, mais moins jaune que chez le mâle de cette espèce; les nervures des ailes inférieures sont moins épaisses et moins blanches que chez la *rhamnii*; mais le point ferrugineux du disque ainsi que les petits points bruns de la rangée circulaire des ailes inférieures et ceux qu'on remarque sur la frange ne diffèrent point de la *rhamnii*.
- " La femelle ressemble par sa couleur à celle de la *rhamnii*.
- " Les antennes n'ont paru plus droites, d'un rougeâtre plus foncé, sans teinte plus claire sur aucune de leurs parties. Le corselet, en dessus, paraît plus noir, les poils qui le recouvrent étant blancs, même chez le mâle.
- " Cette espèce a été prise sur les bords de l'Amour par M. Schrenck, depuis Bourri à l'embouchure de l'Oussouri, jusqu'à Kïdsi, pendant les mois de Juin et Juillet." (*Mémoires*, t. c.)

Var. *acuminata*, Felder. "Alis maris omnino sulphureo-flavis, femine albedo-virescentibus, anticis apice acuminato producto, posticis supra macula grossa aurantiaca.

- " In montibus prope Ning-po. A speciminibus Amurensibus statura majore, colore latiore, uniformi, maculis discalibus distinctioribus apiceque alarum anteriorum magis producto, subhamato recedit." (*Felder*, l. c.)

The typical form of *aspasia* occurs commonly at considerable elevations in the neighbourhood of Ta-chien-lu and at Wa-shan, Chia-ting-fu, and Moupin in Western China. The specimens vary in size but do not differ from Amurland examples. In Central and Eastern China and in Japan the species is represented by var. *acuminata*, which is a larger form and has the apices of primaries more produced, this latter character is, however, not constant. A

more important difference is that the secondaries are of the same colour as the primaries, whereas in the type the secondaries are paler than the primaries. The Japanese specimens have dark yellow primaries, quite as dark in fact as those of *G. rhamni*, var. *maxima*. Pryer says that *acuminata* occurs in the mountains of Central Japan and on the plains of Yesso, and he mentions capturing freshly emerged specimens of both *maxima* and *acuminata* on Asama-Yama at the same time. I only met with *acuminata* in the mountains of Japan. Herz records *aspasia* from Corea, and Alphéraky (Rom. sur Léop. v. p. 100) mentions it from the Province of Kansou, and remarks on the darker colour of the fore wings.

Dr. Staudinger, who holds *rhamni* and *aspasia* to be distinct species, considers *acuminata*, Felder, to be a variety of the former. This determination is somewhat difficult to reconcile with Felder's description of *acuminata*. Although I have retained *aspasia* here as a distinct species I am not at all satisfied that it is entitled to rank as such. I have received hundreds of specimens of both *rhamni* and *aspasia* from China and Japan, and in a series of over eighty examples which I selected for my collection I find that there is the same amount of colour variation in *aspasia* as in *rhamni*; the angulation of the wings is subject to the same kind of modification in both; the size of the orange discal spot is also variable. The only character by which I am able to separate *rhamni* from *aspasia* is that the veins on the under surface of secondaries are thicker in the former, but even this fails in specimens from Loochoo, and does not serve to distinguish some examples of *aspasia*, var. *acuminata* from *rhamni*, var. *farinosa*. No definite conclusions can, however, be arrived at until we have a more complete knowledge of the earlier stages of *aspasia* and its forms.

In the North-western Himalayas *G. zanea*, Moore*, replaces *aspasia*, and is probably only a local race of that species; it is distinguished by the scalloped outer margin of secondaries.

Aspasia appears to be a mountain insect, whilst *rhamni* occurs in the valleys, occasionally wandering into the mountains.

Graeser met with the larva of *aspasia* on *Rhannus davurica*, but unfortunately did not describe it.

* Proc. Zool. Soc. Lond. 1865. p. 493, pl. xxxi. fig. 18.

Genus DERCAS.

Dercas, Boisduval, in Doubleday, Gen. Diurn. Lep. p. 70 (1847); Distant, Rhop. Malay. p. 308 (1885).

- “Anterior wings subtriangular, the costal margin convex, the apex more or less dentate, the outer margin oblique, the inner margin concavely sinuate. Costal nervure terminating on costa a little beyond end of cell; first subcostal nervule emitted at less than one third before end of cell, second near end of cell, third and fourth subcostal nervules bifurcating nearer end of cell than apex of wing, fifth emitted at about two thirds the distance between end of cell and bifurcation of third and fourth; upper discocellular nervule concave and a little less than one half the length of lower, which is directed outwardly towards its base; upper median nervule convexly rounded at base and emitted from end of cell; second from a little before end of cell, lower at about one third before end of cell; cell short and broad; submedian nervure somewhat bent inwardly near base, and then outwardly along its apical half. Posterior wings elongately and irregularly subovate; costal margin obliquely convex, outer margin prominently and angularly produced at upper median nervule, from whence to anal angle the margin is more or less concavely sinuate. Costal nervure short, extending to about half the length of costal margin; first subcostal nervule emitted at about one fourth before end of cell, second from end of cell; upper median nervule short and oblique, lower more than twice the length of upper and bent inwardly; upper median nervule from end of cell, second emitted at about half the distance from first as from third; submedian nervure moderately bent outwardly; internal nervure bent inwardly. Body moderately robust, pronotum pilose; antennæ short, with a gradually formed but distinct apical club; palpi short, compressed, broad, and clothed with long adpressed hairs, apical joint minute.
- “This genus is of small extent, and may be taken as an Eastern representative of the genus *Gonepteryx*. *Dercas* is found in Continental India, the Indo-Malayan region, and in China. One species inhabits the Malay Peninsula.” (*Distant, l. c.*)

***Dercas wallichii*. (Plate XXXV. fig. 3, ♂.)**

Gonepteryx wallichii, Doubleday, Proc. Ent. Soc. Lond. v. p. xlvii. (1848).

Gonepteryx urania, Butler, Proc. Zool. Soc. Lond. 1865, p. 458, pl. xxvi. fig. 5 ♀.

- “Alis omnibus kete flavis, anticis apice acuminato nigro, macula pone medium rotundata nigra; posticis rotundatis.
- “Exp. alar. 2½ unc., vel 62 millim. Habitat, India sept.
- “Head black. Antennæ reddish. Thorax black, clothed thinly with yellow hairs. Anterior wings acuminate, falcate, the outer margin slightly sinuate below the apex, above pale bright yellow, the apex marked with a black patch trisinate internally, the middle sinus deep, the others much slighter; the termination of the costal nervure, and also of the first and second subcostal nervules, marked with a small black dot; two small black dots on the outer margin, and a large rounded spot, bordered below with ferruginous, between the first and second median nervules, not far from their origin. Posterior wings rounded, pale, bright yellow, the terminations of the nervules marked with a small black dot. Below all the wings paler than above, sprinkled with small ferruginous atoms, the discocellular nervule of both wings marked with a geminate ferruginous spot, bippilled with silver; the anterior wings marked

with a silvery cloud, from which a faint ferruginous line runs across the wings nearly to the anal angle, touching a spot in place of the rounded spot of the upper surface, but of a paler colour. Legs nearly white.

"This species may be known from *Gonepteryx verhuellii* by its rounded posterior wings, and from *Gon. lycorias* by the large spot of the anterior wings and other characters." (*Doubleclay, l. c.*)

Female (urania, Butler). "Upside: front wings pale yellow, deeper at the outer margin; anterior margin much curved, and ending at its outer extremity in a sharp, uncut apical point; outer margin slightly sinuated on its upper edge: apex brown, deeply sinuated and dentated; a large, perfectly circular, deep-brown spot between the first and second submedian nervules. Posterior wings somewhat quadrate, pale yellow, deeper at the outer margin.

"Underside: front wings dirty yellow, paler on the inner margin; discoidal cell irrorated with brick-red; a small irregular silver spot surrounded with red in the middle of the end of the cell, with a minute vertical lunule just above it; the costal and subcostal nervules ending in small red spots; a somewhat triangular silver dash on the anterior margin, close to the apex: a large ferruginous round spot, ending below in a fine oblique red line, between the first and second submedian nervules; two small, longitudinal, oblong, pale brown spots placed obliquely between it and the silver apical dash. Posterior wings dirty yellow; cell irrorated with brick-red, a small irregular silver spot, surrounded with red, in the middle of the end of the cell, with a minute red lunule just above it; a small brown lunule above the end of the cell, and halfway between it and the anterior margin; a band of oblong pale brown spots crossing the wing between the nervules, and following the direction of the outer margin." (*Butler, l. c.*)

Although described as a distinct species *urania* is without doubt the female of *D. wallichii*.

Chinese specimens of *D. wallichii* are rather larger than those from India. In the males the costa towards apex is marked with red, and there is an oblique streak of the same colour, interrupted by the nervules, from the apical black patch. The under surface is identical with that of Indian specimens of the same sex. The females from both countries are alike.

Fairly common throughout Central and Western China at moderate elevations; the female is scarcer than the male.

Elwes (*Trans. Ent. Soc. Lond.* 1888, p. 415) refers to a specimen from the interior of Sikkim, but the species must be rare in that district, as there were no examples of it in the collection of the late Otto Möller. It seems, however, to be plentiful in the Khasia Hills.

In his 'Catalogue of Diurnal Lepidoptera' Kirby (p. 489) gives China as a locality for *D. verhuellii*, an allied species, but this was not observed in any part of the country visited by my collectors.

Genus PIERIS.

Pieris, Boisduval, Sp. Gén. i. p. 434 (1836); Doubleday, Gen. Diurn. Lep. i. p. 42 (1847).

"HEAD rather small, hairy.

"Eyes round, moderately prominent.

"Labial palpi longer than the head; the first joint generally much longer than the second, both stout, more or less cylindrical, especially the first, clothed anteriorly with long hairs; third joint cylindrical, slender, rather pointed, mostly as long as, or longer than, the second, clothed with short appressed scales, and a few hairs in front at the base.

"Antennæ of moderate length, with a short obconic club, generally compressed.

"THORAX moderately stout, clothed with long delicate hairs.

"Anterior wings more or less triangular, sometimes elongate, slightly falcate, or rounded externally. Subcostal nervure three-, or four-branched. Upper discoidal nervure united to the subcostal for some distance beyond the cell. Lower discocellular rather long, curved inwards.

"Posterior wings obovate, sometimes rather elongate, with the base slightly produced anteriorly; sometimes more rounded. Discoidal nervure becoming a third median nervure. Inner margin forming a very distinct channel for the reception of the abdomen.

"Legs moderately strong. Claws deeply bifid. Paronychial not quite equal to them in length, broad, subtriangular. Pulvillus as long as the claws, jointed.

"ABDOMEN rather slender, not extending to the end of the wings.

"LARVA subcylindric, with the head small, rounded; more or less clothed with hair.

"Pupa angular, pointed anteriorly, not arched, sometimes tuberculate; abdominal segments tapering to a point." (Doubleday, l. c.)

***Pieris napi*.** (Plate XLIII. figs. 1 ♂, 2 ♀.)

Papilio napi, Linnæus, Syst. Nat. i. 2, p. 760 (1767).

Pieris napi, Lang, Butt. Eur. p. 31, pl. vii. fig. 1 (1884).

"Expands 1.50 to 1.87 in. Wings white, with the bases dusky. The nervures are distinct and black. The fore wings have the tips, and sometimes the ends of the nervures, dusky. Male sometimes with, but often without, a small black spot midway between the centre and the hind margin. Female with two black spots, as in *P. rapæ*. Hind wings with a black spot on the costa. The female is usually larger than the male, and is always darker, having blackish scales running along the course of the nervures. Underside: fore wings white, tipped with greenish yellow, with nervures conspicuous, and with two black spots, as in the allied species. Hind wings pale yellow, with dark scales placed thickly along the course of the nervures, giving the appearance of green veins.

"Larva green, brighter on the sides than on the back; the spiracles are marked with red and yellow. Feeds on various kinds of *Cruciferae* and *Rosaceæ* from June to September. It hibernates as a pupa, which is greyish or greenish yellow, speckled with black." (Lang, l. c.)

Figures of the early stages and a full life-history of this species are given in Buckler's 'Larvæ of British Butterflies.'

I have four examples (2 ♂ and 2 ♀) of this species from Yesso. They differ from the type on the upper surface in having only faint traces of black at apex of primaries; the black spots are only shadowy in the female and are entirely absent in the male, and the venation is well marked. On the under surface all the specimens are quite typical.

I believe that *P. napi* does not occur in the Central or Southern Islands of Japan, nor in the Corea or China, and that specimens recorded from these countries as *P. napi* are referable to the spring form of *P. melete*. There were no specimens of *P. napi* in Pryer's collection, and the examples figured by him in his 'Rhopalocera Nihonica' represent the seasonal forms of *P. melete*. In Amurland there are two broods, but it is not common in any part of that region.

In Europe some examples of the second brood have the under surface of secondaries paler and the veins are bordered with blackish only as far as the discoidal cell (var. *napiæ*, Esper). A yellowish-grey suffused form of the female occurs in boreal and alpine regions, this is the var. *bryoniae*, Ochsenheimer. In the Alai Mountains and other parts of Central Asia a small darkly marked race (*ochsenheimeri*, Standinger) occurs.

Distribution. Europe, Northern, Eastern, and Central Asia.

Pieris melete. (Plate XLIII. figs. 3 ♂, 4 ♀ var.)

Pieris melete, Ménétriés, Cat. Mus. Petr. ii. p. 113, pl. x. figs. 1, 2 (1857).

Pieris aglaope, Motschulsky, Etud. d'Entom. ix. p. 28 (1860).

Synchlœ megamera, Butler, Cist. Ent. i. p. 173 (1873).

Pieris napi, var. *orientis*, Oberthür, Etud. d'Entom. v. p. 13 (1880).

Ganoris dulcinea, Butler, Ann. & Mag. Nat. Hist. (5) ix. p. 18 (1882).

Pieris napi, Pryer, Rhop. Nihon. p. 6, pl. iii. figs. 8 a, 8 b (1886).

Pieris melete, var. *veris*, Standinger, Rom. sur Léop. iii. p. 126, pl. xvi. figs. 1, 2 (1887).

Pieris erutæ, Boisdu, MS., Poujade, Ann. Soc. Ent. France, 1888, p. xix.

“*Mâle.* Ailes blanches à sommet noirâtre en dessus, avec une tache grande, à bords non arrêtés, placée non loin du bord externe des supérieures.

“*Femelle.* Ailes blanches, à reflets opalins, sommet et bord interne des supérieures largement noir, ainsi que les quatre nervures des ailes inférieures depuis la cellule discoidale.

“ Cette espèce est à peu près de la taille et de la forme de la *P. brassicae*; la femelle est plus grande que le mâle, au moins chez les exemplaires du Japon.

“ Le mâle est en dessus blanc, avec la base des ailes supérieures et leur bord antérieur saupoudrés

de noir; ces ailes ont leur sommet noir, à la manière de la *P. brassice*, ainsi qu'un gros point noir, à contours non arrêtés, qui est placé plus proche du bord externe que chez l'espèce indiquée plus haut; et plus ou dessous non loin de l'angle interne, l'on distingue la trace de la tache du dessous. Les ailes inférieures présentent comme chez la *brassica*, une tache noire placée sur le milieu du bord costal, avec les trois ou quatre premières nervures noires.

- "En dessous les ailes diffèrent en ce que les supérieures n'ont pas de noir à leur sommet, mais au contraire, plus de la moitié de la cellule discoidale est fortement saupoudrée de noir, ainsi que les nervures, surtout la médiane; la tache postérieure, près de l'angle externe, est grande et se prolonge le long du bord interne. Les inférieures un peu lavées de jaunâtre, l'arête basilaire est safranée, et les nervures saupoudrées de noir le long de leurs bords.
- "La femelle est en dessus d'un blanc à reflets opalins, et outre les caractères du mâle, elle offre de plus: la base des ailes supérieures et la plus grande partie de la cellule discoidale fortement saupoudrée de noir; la tache près de l'angle interne atteint ce bord et se prolonge largement tout le long jusqu'à la base. Les ailes inférieures ont leurs nervures brunes, et les quatre premières qui partent de la cellule discoidale sont noires en s'élargissant graduellement, en atteignant le bord externe.
- "En dessous les ailes supérieures sont un peu opalines, et présentent leur sommet légèrement soufre, avec la nervure médiane largement noire, ainsi que les deux taches du dessus. Les ailes inférieures sont lavées de jaune, et leur arête basilaire est de teinte orangée; du reste, ces ailes sont sans taches et leurs nervures sont légèrement saupoudrées de brun.
- "Les antennes sont noires, annelées de blanc, avec l'extrémité de la massue blanche. Le corps est noir en dessus saupoudré de blanc, et parfaitement blanc en dessous.
- "Cette espèce a été rapportée du Japon, par Mr. Goshkevitch, qui l'a donnée à l'Académie. De l'Amour par Mr. Sehrenck." (*Mémoires*, l. c.)

Var. **aglaope**, Motschulsky. "Figura et color subtus tantum *P. napi*, sed alis anticis supra: in ♂ albis, maculis vel punctis nigris antice nullis, in ♀ lateraliter maculis magnis, subquadratis, nigris tribus, postico, ut in *P. ulete*, cum basi lato conjuncto, nervis omnibus nigrescentibus; subtus: in ♀ maculis nigris quadratis modice distinctis, antica marginali oblitterata; alis posticis supra: in ♂ albis, nervis vix nigrescentibus, in ♀ albis, nervis nigrescentibus, antico ad marginem maculatim dilatato; subtus: subtestaceis, lato subviridigrescentibus; antennis nigris, annulis apiceque subalbis.

"Exp. al. ♂ 20 l., ♀ 22 l." (*Motschulsky*, l. c.)

Meganva, Butler.—"Male. Wings above white; the base blackish grey; apical region of costa broadly grey; the outer half of the nervures towards apex blackened; body as in *S. napi*; below very similar to *S. napi*, but the nervures much more distinct, median nervure of primaries and its branches bordered with black; the remainder of the nervures with greyish olivaceous; the two diffused black spots on disc of primaries more distinct than in *S. napi*; secondaries bright golden yellow at base.

"Expansion of wings 2 inches 7 lines.

"Female. Wings above white, the nervures margined with grey; basal half of costa in primaries pale ochraceous; apical area grey; an ill-defined large brown spot between second and third median branches, and a second crossing internomedian interspace; the internal area from the latter spot to the base brown; secondaries with a large brown spot between subcostal branches towards apex; wings below less strongly marked than above; primaries with

apical area pale ochreous; nervures and discal spots more feebly defined; secondaries pale ochreous, the nervures greyish olivaceous, no spots: base golden yellow.

"Expanse of wings 2 inches 6 lines.

"Hakodadi (Hithuly). B.M.

"I formerly supposed this to be a variety of *S. napi* and gave a rough representation of it as such, in a popular paper published in the first volume of 'Nature and Art': it is, however, certainly distinct, being quite as nearly allied to *S. mellea* as to *S. napi*." (Butler, l. c.)

Butler's types of this form are figured (Plate XLIII. figs. 3 ♂, 4 ♀).

Var. **dulcinea**, Butler. "Most nearly allied to *G. megamera* of Japan, but very distinct. Wings above milk-white, with the veins very slenderly grey, but darker towards the apical margin: primaries with slender black costal margin; the basal two fifths of the costal border irrorated with blackish scales: a pyramidal greyish-brown apical patch, divided by white internervular lines into four decreasing spots; a slightly blacker spot just beyond the middle of the second median interspace: veins at base of all the wings edged with blackish scales: body blue-black; thorax clothed with bluish-grey hairs; abdomen grey at the sides. Under surface milk-white, the wings with dusky veins: primaries with the spot upon the second median interspace nearly as above, but slightly browner; a second larger and oblique spot across the fourth fifth of the internomedian interspace: costal border slightly greyish towards the base: no apical markings: secondaries with the costal border at base slightly tinted with pale buff.

"Expanse of wings 2 inches 4 lines.

"Posiette Bay, N.E. Corea, in August.

"This species differs from all its allies in the character of the apical markings of the primaries above." (Butler, l. c.)

Var. **orientis**, Oberthür. "Le type est plus grand que celui d'Europe; les ♂ d'Askold en dessous ont les ailes inférieures lavées de chamois pâle et non de jaune de chrome un peu verdâtre comme les ♂ que nous prenons en France. Les ♀ ont le même caractère et de plus les veines noires très prononcées. Elles ne diffèrent guère de la variété *bryonia* que parce qu'elles ont le fond des ailes blanc, tandis que dans *bryonia* il est presque toujours plus ou moins jaunâtre.

"M. Fabbé David m'a donné trois exemplaires pris à Mou-Pin semblables à ceux d'Askold.

"4 ♂ 2 ♀, pris en mai." (Oberthür, l. c.)

In the above comparative description Oberthür refers to *orientis* as a form of *Pieris napi*.

Var. **crutæ**, Poujade. "Envergure du ♂: 55 à 62 mill.; de la ♀: 57 à 65 mill. Aspect de notre *P. napi*, L., et très voisin de la *P. mellea*, Ménétrières, dont elle n'est peut-être qu'une variété locale de taille plus grande.

"Mâle. Dessus du même blanc verdâtre que la *P. napi*; comme chez la dernière, l'apex des ailes supérieures est noir, peu ou point entre-coupé de blanc aux nervures; entre les deux premiers rameaux de la nervure médiane il y a également une tache formée d'atomes noirs plus ou moins accentuée et même manquant quelquefois. Aux quatre ailes, les nervures sont légèrement teintées de noir, surtout vers les bords externes, où elles sont renforcées de quelques atomes de même couleur. Dessous: ailes supérieures du même blanc que le dessus,

avec l'apex d'un jaune de beurre; ailes inférieures de cette dernière teinte, ayant à la base une tache orangée. Les nervures sont, aux quatre ailes, plus ou moins fortement chargées d'atomes bruns.

"*Femelle*. Ailes plus arrondies que chez le mâle, les inférieures légèrement dentées, à nervures généralement plus chargées d'atomes noirs; apex plus largement noir et tache internervurale toujours bien marquée et touchant presque les deux premiers rameaux de la nervure médiane; une autre tache semblable, située vers le bord interne, lui fait suite comme chez les ♀ de *P. napi* et de *melete*. Sur le bord costal des ailes inférieures, il y a également, comme chez les espèces prises comme terme de comparaison, une tache noire, souvent assez large, située à l'extrémité du premier rameau de la nervure sous-costale. Dessous semblable à celui du mâle, avec les taches et nervures plus larges. Chez quelques femelles, les taches et les nervures sont tellement larges et chargées d'atomes noirs qu'elles donnent à ces insectes un aspect tout particulier.

"Plusieurs mâles et femelles de Mou-Pin (Thibet oriental) rapportés par M. l'abbé A. David, qui en a fait don au Muséum." (*Poujade, l. c.*)

Var. *veris*, Staudinger. Smaller than the type, wings almost entirely white with the exception of a black apical patch on primaries. The large black outer marginal spot, found in *melete*, is either absent or only faintly indicated. In the female the veins are more or less bordered with blackish, the apical patch is represented by a streak along the costa, and the outer marginal spots are fainter and smaller, but the lower of these joins the black inner marginal streak which in this form extends to the base of the wing. The under surface of *veris* differs still more from typical *melete*, as all the veins are broadly bordered with greyish black, the black spots are only rudimentary, and in some examples one or both are entirely absent; the secondaries and apices of primaries are in both sexes somewhat strongly tinted with yellow, as is occasionally seen in some females of *melete*; the orange basal spot* of hind wing is quite as well defined as in the type.

The above is an abridged translation of Dr. Staudinger's description of var. *veris*, from Annuland.

Var. *mandarina*, var. nov. Larger than the type. The male has the apical border of primaries continued further along outer margin and the black spots are more distinct. The female is more suffused with blackish and the venation is heavily charged with black. On the under surface the venation is blackish in both sexes. Occurs in North China during the summer months.

As a rule the apical patch on primaries does not pass below the third median nervule in Japanese male specimens of *P. melete*, but in some examples it extends into the second median interspace, where it unites with the black spot. In these specimens the nervules of secondaries are broadly bordered with black on outer margin. The females from Japan have the costal area, discoidal cell, and submedian interspace much suffused with fuliginous grey; the apical patch is broad and frequently absorbs the spot in second median interspace; whilst the spot in submedian interspace is merged in the broad extremity of the inner marginal streak. In both sexes the venation

* This important character has been omitted in the figure of var. *veris*.

on under surface is but little darker than the ground-colour as a rule, but sometimes it is rather paler and in a few instances it is slightly tinged with blackish.

In some male specimens of the Chinese spring form (var. *erata*, Poujade) there is no black spot in the submedian interspace; in others the black apical patch is narrower than usual and extends along the outer margin to just below second median nervule; in other specimens again the nervules of secondaries are heavily charged with black towards outer margin. The females are generally white, more or less suffused with dark grey, and marked with black, but a few specimens from Western China are yellowish, suffused and marked with dark grey, resembling in appearance the Alpine and boreal form of the female of *P. napi*, var. *bryonia*, Oehsenheimer. There is considerable variation in the size and intensity of the black markings. In one example from Chang-yang, the base of primaries only is slightly suffused with dark grey, the black streak along median nervure and that on inner margin, as well as the apical patch, are narrow, the black spot in second median interspace is round and that in submedian is almost separated from the streak on inner margin; on the secondaries the neuration is only narrowly bordered with black and the spot at outer angle is round. Another specimen, from Wa-shan, has all the wings broadly bordered with black, and the costa, discoidal cell, and submedian interspace finely powdered with dusky scales. All the Chinese specimens of both sexes differ on the under surface from typical *melete* in being whitish rather than yellowish, the venation is broadly bordered with blackish, and the black spot in the submedian interspace is smaller.

Apart from other characters the yellow patch at base of secondaries, on the under surface, will almost always separate this species from any of the forms of *P. napi*.

Typical *P. melete* occurs commonly during the summer months in Amurland, Japan, and Corea, and in all the parts of China visited by my collectors it is represented by the form here described as var. *mandarina*.

The spring brood in Japan has been described by Motschulsky as *aglaope* and by Butler as *megamera*. Poujade describes the spring form from Moupin under Boisduval's MS. name of *erata*; Oberthür describes it as *orientis* from specimens taken in Askold in May, and states that he has examples from Moupin which exactly agree with them. These latter were taken, as well as Poujade's types of *erata*, by Abbé David in Moupin, and are without doubt referable to the same form. Staudinger says that he has never received

orientis, but he considers that it is probably the large summer form of *P. napi*. In coming to this conclusion Dr. Staudinger must have omitted to note that Oberthür distinctly says that his types of *orientis* were taken in May. I have received specimens from Moupin and other parts of China which agree exactly with *erata*, Poujade, but so far as I am aware no form of *P. napi* has been met with in any part of China. The spring form occurring in Posiette Bay has been named *dulcinea* by Butler; Staudinger, who ignores Butler's *dulcinea* altogether, describes var. *veris*, a very similar form from Askold, the locality from which Oberthür's *orientis* was obtained. *Veris* differs from *dulcinea* in being without black spots on primaries and in having the under surface of secondaries greenish and the veins more strongly bordered; the apical patch in both forms is more like that of *P. napi* than of *P. melete*.

In my opinion none of these varietal names for the spring brood are worth retaining, as in every locality where it occurs the specimens of this brood exhibit more or less variation in the character of the black markings.

Graser (Berl. ent. Zeit. 1888, p. 67) states that he met with young larvæ, which resemble those of *P. daphidice*, feeding on a cruciferous plant growing on an island in the River Amur. Pryer, who bred the summer form, *melete*, from ova deposited by a female of the spring form, gives *Arabis hirsuta* as the larval food-plant.

Mr. Elwes, in discussing *P. melete* (Trans. Ent. Soc. Lond. 1888, p. 416), seems to refer to the female sex only, as he compares his Sikkim specimens with *bryonia*, which is a form of female *P. napi*, and with the figure of *ajaka*, Moore, which also represents a female. He states that there appears to be no brood in India agreeing with the summer form from Amurland and Japan, and records the species from the Khasia hills in September, and also from the interior of Sikkim.

The following table will show the geographical distribution of the different named forms of the two broods of *P. melete*:—

Spring brood:

- aglaope*, Motschulsky; Japan.
- megamera*, Butler; Japan.
- dulcinea*, Butler; Posiette Bay.
- orientis*, Oberthür; Askold and Moupin.
- veris*, Staudinger; Amurland.
- erata*, Poujade; Moupin.

Summer brood :

melete, Ménétriés ; Amurland, Corea, and Japan.

mandarina, Leech ; Northern China.

ajuka, Moore ; North-west Himalayas (the spring form, which is smaller and less heavily marked with black, is unnamed).

Distribution. Amurland, Askold, Corea, Japan, North and Central China, Sikkim, N.W. Himalayas.

Pieris extensa. (Plates XXXVI. figs. 4 ♂, 5 ♀ var.; XLIII. fig. 6 ♂.)

Pieris eruta, var. *extensa*, Poujade, Ann. Soc. Ent. France, 1888, p. xix.

Pieris eurydice, Leech, Entomologist, xxiv, Suppl. p. 5 (1891).

“ Envergure : ♂, 70 mill. ; ♀, 76 mill. Cette variété ne diffère de l'espèce précédente que par une taille plus grande et par les nervures à peine marquées de noir ou de brun, tant en dessus qu'en dessous, chez la femelle : la tache noire de l'apex du dessus des ailes supérieures est aussi moins étendue. Le bord costal des ailes supérieures paraît plus arrondi chez la femelle. “ Décrit sur deux mâles et deux femelles. Moupin.” (*Poujade, l. c.*)

Var. ***eurydice***, Leech. (Plate XXXVI. figs. 4 ♂, 5 ♀.) Closely allied to *P. melete*, Ménétriés, with which species both sexes agree in general characters, but they are respectively larger : the clubs of the antennæ are not tipped with yellow ; the discocellular nervules of primaries form a regular curve without indentation ; these nervules and the median nerve are thickly bordered with black scales ; there are two black spots in the second median interspace (confluent in the female) ; the black apical border of primaries is narrower than in *melete*, and extends along outer margin as far as third median nervule, and there is a small black spot at the end of second median nervule. On the under surface of primaries the discoidal cell is not sprinkled with black scales as it is in *P. melete*. The female is less suffused with black than the same sex of *P. melete*.

Expanse, ♂ 80–86 millim. ; ♀, 72–76 millim.

I have accurate drawings of the insects described by Poujade as *Pieris eruta*, Boisduval, and *P. eruta*, var. *extensa*. The first-named is certainly identical with the Chinese spring form of *P. melete* ; whilst the so-called female of *extensa* is really a male of the summer brood, and agrees in every respect with the male type of my *P. eurydice* (Plate XXXVI. fig. 4 ♂). The male type of *extensa* is almost identical with a specimen from Omei-shan (Plate XLIII. fig. 6) in my collection, which I consider to be an example of the first brood of *eurydice*.

Occurs in July at Moupin, Omei-shan, Wa-shan, Chia-kou-ho, and Huang-mu-chang in Western China, and also at Chang-yang in Central China.

Pieris cisseis. (Plate XLIII. fig. 5 ♂.)

Pieris cisseis, Leech, Entomologist, xxiii. p. 192 (1890).

Male. White; apex of primaries broadly black; at the outer extremity of discal cell is an elongate black spot, and towards external margin of the wing are two black spots,—the upper one is the largest, and is connected with the apical band. Under surface:—The black spots of primaries are reproduced, but the apex and costa are yellowish; secondaries clear pale yellow. Expanse 76 millim.

This interesting species appears to be exceedingly rare. I have only received one specimen, which was taken by a native collector at Changyang.

Resembles the female of *P. brassicae*, but the black discal spot at once distinguishes it. The secondaries are without darker scales on the under surface.

Pieris canidia.

Papilio canidia, Sparrman, Amoen. Acad. vii. p. 504, note *m* (1768).

Papilio glyciria, Cramer, Pap. Exot. ii. pl. clxxi. figs. E, F (1779).

Pieris glyciria, Boisduval, Sp. Gén. i. p. 524 (1836).

Synchlōs claripennis, Butler, Ann. & Mag. Nat. Hist. (4) xix. p. 96 (1877).

Synchlōs sordida, Butler, l. c.

Allied to *P. brassicae*, but the male differs from the same sex of that species, on the upper surface.

in having the inner edge of the black apical and outer marginal border of primaries deeply indented between the nervules; there is a black spot on primaries between second and third median nervules, a series of black spots on the outer margin of secondaries, and the costal spot of these wings is generally larger than in *P. brassicae*. On the under surface *P. canidia* agrees with *P. rapae* in having a pale space above and a dark streak below the median nervure of secondaries, but the base of costa is bright orange-yellow.

Female similar to the male, but the base and discoidal cell of primaries is powdered with black scales, there are two large black spots on these wings and the black spots on outer margin of secondaries are larger than in the male.

Expanse, ♂ and ♀, 49–70 millim.

Var. **claripennis**, Butler. “*Male*. Wings above white, with black markings nearly as in *S. glyciria*, but the base less suffused with grey, and the large discal black spots of primaries absent on the upper surface; primaries below with the discal spots well marked and large, the basal two fifths of the cell grey; secondaries with the lower half of the cell and the median interspaces greyish, base of costa broadly orange.

“Expanse of wings 2 inches 8 lines.” (*Butler, l. c.*)

Var. **sordida**, Butler. “*Male*. Wings above white, base blackish; primaries with the basal half of costa grey; an oblong costal patch at apex, its inner margin dentated, its externo inferior

angle confluent with the first of the three subapical marginal conical spots, all greyish brown : secondaries with a costal and four decreasing squamose marginal spots blackish. Primaries below with the basal three fifths of discoidal cell and the basal half of costa densely irrorated with dark grey ; apical area sandy yellow, sparsely irrorated with grey ; two discal blackish spots as in *S. rapæ* : secondaries pale yellow, densely irrorated with dark grey, excepting the veins and internervular folds ; base of costa golden orange.

“Expand of wings 2 inches 4 lines.” (*Butler, l. c.*)

P. canidia varies in the size and intensity of the black markings. In some specimens the discal spots are entirely absent above (var. *claripennis*, Butl.), and there are only slight traces of them below, whilst the apical and marginal markings in these specimens are much reduced in size, and dark greyish rather than black in colour. The under surface of secondaries is often sprinkled with dark grey, and extreme examples of this form are the var. *sordida*, Butl. Some of the females have the spots on outer margin of secondaries very large and more or less confluent.

Generally distributed throughout China. I took a very large series in Hong-Kong, Foochau, Ningpo, and Gensan, and they varied equally in every locality. The Corean specimens are usually smaller than Chinese examples.

Pryer obtained the species from the Loochoo islands, but it does not appear to be found in Japan. It is a common species in India ; according to Elwes (*P. Z. S.* 1888) it occurs in Sikkim up to an elevation of 12,000 feet, and is very variable in size.

Staudinger describes a form of this species from Turkestan under the name of *palvartica* (*Stett. ent. Zeit.* 1886, p. 199). Grun-Grshimailo met with this form in stony gorges in the Pamir at elevations of from 5000 to 7000 feet.

Distribution. Turkestan, the Pamir, India, China, Corea, Loochoo Islands, Hainan, and Cachar.

Pieris rapæ.

Papilio rapæ, Linnaeus, *Syst. Nat.* i. 2, p. 759 (1767) ; Esper, *Schmett.* i. 1, pl. iii. fig. 2 (1777) ; Hübner, *Eur. Schmett.* figs. 404, 405 (1798?).

Pieris rapæ, Lang, *Butt. Eur.* p. 30, pl. vi. fig. 4 (1881) ; Pryer, *Rhop. Nihon.* p. 6, pl. iii. fig. 6 (1886).

Pieris brassicae, var. *crucifera*, Bois-duval, *Sp. Gén.* p. 522 (1836).

Pieris rapæ, var. *orientalis*, Oberthür, *Etud. d'Entom.* v. p. 13 (1880).

Pieris rapæ, var. *maudschurica*, Speyer, *Stett. ent. Zeit.* 1882, p. 379.

“Expands 1.50 to 1.75 in. Wings white. Fore wings dusky at the tip, but not so dark as in

brassica: two round black spots in the centre of the wing of the female, which is generally darker than the male. Hind wings rounded, white, with a small blue costal spot. Under-side: anterior wings tipped with ochre, and with two black spots in both sexes. Hind wings pale ochre, more tinged with yellow than in *brassica*.

“*Larva*. Green, covered with down, with one dorsal and two lateral yellow lines. Lives on *Cruciferae* and is often destructive in gardens.

“*Pupa*. Ashy, speckled with black, often tinged with reddish.” (*Latag, l. c.*)

For a fuller account of the early stages of this species, see Buckler's ‘Larvæ of British Butterflies,’ where figures of the larva and pupa are given.

Var. **crucivora**, Boisduval. “Un peu plus petite, avec la base des ailes supérieures largement d’un cendré noirâtre (surtout chez la femelle), ainsi que la côte et le sommet.—Japon. Coll. Boisd.” (*Boisduval, l. c.*)

Described by Boisduval as a form of *P. brassica*.

Var. **orientalis**, Oberthür. “Diffère du type européen par une taille plus grande, un plus grand développement des parties noires et en dessous par une teinte jaune plus pâle à l’aile inférieure. De plus, le long de la côte et presque jusqu’à l’extrémité de la cellule discoïdale, on voit un lavis d’un jaune assez vif. Je possède une seule femelle d’Askold, une autre semblable du Japon et une troisième prise dans le nord de la Chine par M. l’abbé Armand David.” (*Oberthür, l. c.*)

Var. **mandschurica**, Speyer. “Al. ant. macula apicali majore, subtriangula, nigerrima, maculisque (♂, ♀) cellul. 3 et 1 b supra nigris; al. post. subtus parcissime pulvereis, maris exalbidis, feminae dilute luteis, margine interiore albo.

“Patria: terr. Amur.” (*Speyer, l. c.*)

I have no doubt whatever that *crucivora*, Boisduval; *orientalis*, Oberthür; and *mandschurica*, Speyer, are referable to the large form of *P. rapæ* which occurs in the summer and is found commonly throughout the region here dealt with as well as in Amurland. Boisduval's description of *crucivora* certainly applies to this form, and it is probably owing to his placing it as a variety of *P. brassica*—an insect which, I believe, does not occur in any part of Eastern Asia—that M. Oberthür redescribed the form under the name *P. rapæ*, var. *orientalis*.

The typical form of *P. rapæ* also occurs commonly in China, Japan, and the Corea, and exhibits the same range of variation in the black markings as obtains among European specimens.

Some female examples of *P. rapæ* which I met with in Kashmir are suffused with blackish scales about the base and disc of primaries, but not to the same extent as in the var. *crucivora*.

The late Mr. H. Pryer informed me that in its earlier stages *P. rapæ*, in Japan, is quite typical, and the larvæ feed on Cruciferae.

Distribution. Europe, North Africa, and the temperate parts of Asia.

Genus SYNCHLOË.

Synchloë, Hübner, Butler, Cist. Entom. i. p. 51 (1870).

"*Front wings* subtriangular; upper discocellular about half the length of the lower, oblique; lower discocellular angulated, nearly perpendicular.

"*Hind wings.* Upper discocellular half the length of lower, oblique; lower discocellular much less oblique, and more or less arched.

"*Body* hairy; palpi slender, hairy beneath; antennæ with more or less distinct flattened club.
"Type *S. edulicis*, Esper." (*Butler, l. c.*)

Synchloë daplidice.

Papilio daplidice, Linnaeus, Syst. Nat. i. 2, p. 760 (1766); Hübner, Eur. Schmett. figs. 414, 415 (1798?).

Pieris daplidice, Lang, Butt. Eur. p. 33, pl. vii. fig. 4 (1884).

Synchloë daplidice, Butler, Proc. Zool. Soc. Lond. 1872, p. 62.

"Expands 1·50 to 1·80 in. Wings white, marked with black and grey above; the hind wings having a chequered pattern of green beneath. The tip of the fore wings is black in both sexes, divided by four small white spots, each one sending an elongation into the marginal fringe; at the extremity of the discoidal cell is a black spot, in which the discoidal nervure appears as a fine white line; this black spot is narrow in the male, large and square in the female; the latter has also a black spot of a round or lunar shape near the hind margin. The hind wings are white and unspotted in the male, showing the pattern of the underside through. In the female they have a black border formed of crescentic patches, with the convex edge inwards, and divided by black dashes. Underside:—Pattern of the fore wings the same as above, except that the border of the tip and hind margin is powdered with green scales, also the discoidal spot; the base of the wing is tinged with greenish yellow and there is a black spot near the inner margin in both sexes. Hind wings green, with a slight tinge of yellow, and finely powdered with black scales; on this ground-work there is an arrangement of white spots, disposed as follows:—Two or three irregularly placed near the base of the wing; outside these a row forming a band; and again external to these, a marginal row of five spots, oval or nearly quadrate.

"*Larva.* Greyish blue, covered with small black granulations, with four longitudinal white stripes, and with a yellow spot on each segment. The legs and ventral surface are white. Chrysalis grey, speckled with black, and with reddish stripes. The larva feeds, like other species of the genus, on Cruciferae and Resedaceæ." (*Lang, l. c.*)

For figures of the early stages and a complete life-history of this species, see Buckler's 'Larvæ of British Butterflies.'

Occurs sparingly in Western China at Wa-shan, Chow-pin-sa, and Ta-

chien-lu. The specimens are very large, but do not otherwise differ from European examples. Bremer records it from Peking, and Elwes (P. Z. S. 1881) states that he has specimens from China, locality uncertain but probably from Shanghai.

Alphéraky (Rom. sur Léop. v. p. 98) refers to typical *daplidice* from North-west China, and var. *bellidice* from Amdo.

In the Corea, this species flies over cornfields in the neighbourhood of the Japanese settlement at Gensan; the specimens are identical in every respect with those occurring in Europe. Fixsen (Rom. sur Léop. iii. p. 265) also records it from Corea. De l'Orza is the only author who mentions *S. daplidice* from Japan, but although the record is so far unconfirmed I do not see any reason why this wide-ranging species should not occur in that country.

I met with the species commonly in Kashmir; the female examples from that country are very strongly marked with black and the ground-colour is tinged with yellow.

Standinger (Rom. sur Léop. vi. p. 142), is of opinion that *A. belemida*, var. *orientalis*, Bremer, taken by Radde in Amurland, is only an aberrant specimen of *S. daplidice*.

Distribution. Europe, Canary Isles, Madeira, North Africa, and the temperate parts of Asia.

S. chloridice, Hübner, an allied species, is recorded from S.W. Thibet and Ladak, and I have received specimens of it from M. Grum-Grshimailo which were taken at Chuan-che (? N.E. Thibet). He also took *S. butleri*, Moore, in the Nian-Chau mountains, and Alphéraky records the latter species from the plateau of Amdo.

Synchloë callidice.

Papilio callidice, Esper, Schmett. i. 2, pl. cxv. figs. 2, 3 (1860?).

Pieris kalora, Moore, Proc. Zool. Soc. Lond. 1865, p. 489, pl. xxxi. fig. 15.

Pieris callidice?, var. *kalora*, Alphéraky, Rom. sur Léop. v. p. 98 (1889).

Var. *kalora*, Moore. "White. *Male*. Fore wing with a transverse quadrate black spot at end of discoidal cell; apex and submarginally before it with a series of ill-defined blackish spots. Underside dull white; fore wing as above; hind wing with all the nervures broadly margined with pale greenish brown, with a submarginal series of lanceolate marks of the same colour, the intermarginal spaces being white.

- “*Female*. Base of wings, nervures, and exterior margin of hind wing suffused with greenish grey. Fore wing with the discoidal, black, transversely quadrate spot large, the black marginal and submarginal band broad, the interspaces forming a series of white outwardly pointed spots. Hind wing with a similar submarginal, apically black, zigzag band, the intermarginal space forming a series of white inwardly pointed spots.
- “*Expanse*, ♂ $1\frac{1}{2}$ inch, ♀ $1\frac{3}{8}$ inch.” (*Moore, l. c.*)

My collectors did not meet with this insect in any part of China that they visited, but M. Potanine obtained specimens in April at Sinine, Province of Kansou. In referring to these specimens, Alphéraky says that they are intermediate between his var. *orientalis* * from Kuldja and *chrysidice*, Herr.-Schäff.

“The female is smaller, but does not otherwise differ from *orientalis*; but the male is at once distinguished by its more slender form and the absence of the black spot above first nervure of primaries. Probably it is identical with *kalora*, Moore, at least the figure of male *kalora* is exactly like the male from Sinine, and both approach var. *chrysidice* from Asia Minor.”

Var. *kalora*, Moore, is one of the commonest of the Pierinæ met with between 10,000 and 16,000 feet in the North-west Himalayas. It differs only from typical *S. callidice* in the darker green coloration of the under surface and in the female being somewhat more suffused with darker scales on the upper surface. The size of the black spot at the termination of the cell is a variable character both among European and Indian examples, and so also are the dark apical markings of the male.

I received male specimens from M. Grum-Grshimailo labelled *Pieris chrysidice*, var. *kalora*, from Amdo. They differ from all my North-west Himalayan examples in having a larger and more quadrate black spot at end of the cell distinctly bisected with white, and in having one or sometimes two additional spots in the submarginal series of primaries towards inner margin. On the under surface the brownish-green markings of secondaries are much reduced in size, and the interstices are pure white.

Genus METAPORIA.

Metaporìa, Butler, Cist. Entom. i. p. 51 (1870).

- “*Fore wings* subpyriform: second subcostal not so near end of cell as in *Aporìa*; upper discocellular oblique, nearly as long as lower, which is perpendicular and feebly arched; second and third median branches rather near together.”

* Horæ Soc. Ent. Ross. 1881, p. 359.

"*Hind wings* subpyriform; the cell broader, less pointed; discocellulars of equal length, the upper oblique, the lower less so.

"*Body* moderately hairy; palpi slender, hairy beneath; antennae with distinct flattened club.

"Type *M. agathon*, Gray." (*Butler, l. c.*)

Metaporia largeteaui. (Plate XXXVI. fig. 9, ♀ var.)

Pieris largeteaui, Oberthür, *Etud. d'Entom.* vi. p. 12, pl. vii. fig. 1 (1881).

"Voisine de *phryxæ*, Boisduval; à peu près de même taille, et blanche en dessus et en dessous.

Comme *phryxæ*, la *Pieris largeteaui* a la base des ailes inférieures en dessous marquée d'une tache orangée, qu'on aperçoit en dessus par transparence; les nervures sont écrites en noir, finement d'abord; puis le trait noir s'épaissit à mesure que les nervures se rapprochent du bord extérieur qui se trouve ainsi orné d'une série de taches en dessus cunéiformes et en dessous moins larges au contact du bord extérieur, mais prolongées plus loin jusque vers la base par un trait à peu près aussi épais sur chaque nervure. Une ligne noirâtre sinuuse, parallèle au bord extérieur, descend du bord costal de l'aile supérieure jusque près du bord anal des inférieures, au delà de la cellule discoïdale.

"L'abdomen est blanc; les pattes et les antennes sont noires. Un caractère qui distingue bien nettement *largeteaui* de *phryxæ* et de la variété obscure de cette espèce (*agathon*, Gray), c'est que la cellule discoïdale des quatre ailes est toujours à son extrémité fortement empâtée de noir dans *phryxæ* et *agathon*, tandis que dans *largeteaui*, aux ailes inférieures, la cellule est simplement dessinée par un trait noir. Aux supérieures, dans *largeteaui*, la cellule est fermée par un trait un peu plus épais qu'aux inférieures, mais ce trait n'a aucun rapport avec la grosse tache carrée qu'on remarque dans *phryxæ* et *agathon*. Enfin, la bande noire transverse dans *largeteaui* ne tend pas à former au contact des nervures cette dilatation particulière qu'on remarque dans *phryxæ*.

"Je suis heureux de dédier cette belle *Pieris* à M. l'abbé Largeteau, qui l'a prise à Kouy-Tchéou, et l'a envoyée à M. l'abbé Mége, de qui je tiens le bel exemplaire ♂ que j'ai décrit ci-dessus." (*Oberthür, l. c.*)

Male. White, all the veins black; the nervules are bordered with black increasing in width on outer margins, but more especially so on the primaries; all the wings are traversed by a dusky or blackish submarginal band, and there is a small dull yellow spot at the base of the secondaries. Under surface as above, but the black borders of the nervules are more uniform in width, their expansion on the outer margin being more gradual; the transverse band is better defined and the yellow spot at base of secondaries is larger and brighter.

Female. Larger than the male; the black markings are less intense and more diffuse, and there is always a distinct black transverse band on all the wings; the ground-colour is not nearly so white as in the male, and in some specimens it is distinctly yellow. In other specimens a strong tendency to melanism is exhibited; an extreme example of this form of aberration is figured (Plate XXXVI. fig. 9, ♀).

Expanse, ♂ 70-102 millim., ♀ 86-110 millim.

The foregoing description of the male has been made from a specimen which agrees exactly with Oberthür's figure. I have also given a description of the female, which sex has hitherto been undescribed.

The black borders of the nervules vary considerably in width. In some

examples they are so broad that they give the outer half of the wings the appearance of being black marked with white lanceolate streaks in the nervular interspaces; in other specimens the nervules of secondaries are not bordered with black at all. Sometimes the transverse band is entirely absent in the male. In several specimens of the female and a few examples of the male the under surface of secondaries is yellow.

The melanic specimen figured was taken at Chang-yang.

Judging from the enormous number of specimens that I have received *M. largezeui* would seem to be the most abundant member of the *Pierinæ* occurring in Central and Western China at moderate elevations. From *M. phryxæ*, Boisduval, it may be distinguished by the absence of the large black spot at end of the cell of primaries, and by the different character of the transverse band.

Metaporia oberthuri. (Plate XXXVI. fig. 7, ♂.)

Pieris oberthuri, Lecch, Entomologist, xxiii. p. 46 (1890); Oberthür, Etud. d'Entom. xvi. p. 5, pl. i. fig. 2 (1892).

Male. White. Primaries: costa bordered with black; nervules edged on each side with black, expanding towards the outer margin, which appears in consequence to be deeply bordered. Secondaries black at outer angle and halfway along the costa; nervules bordered with black, and there are streaks of the same colour in the interspaces, pointed towards outer margin and bifurcated at their inner end. Under surface similar to above, but the streaks in interspaces of secondaries are connected with the borders of nervules; a deep yellow patch at base of secondaries.

Female. The black borders of nervules of primaries are not quite so broad as in the male, but otherwise there is no difference in the markings of the sexes.

Expanse, ♂ 80 millim., ♀ 92 millim.

In one specimen the whole of the primaries is black with the exception of the discoidal cell, a broad patch from the base between the median nervure and inner margin, intersected by the submedian and a curved series of five oblong spots beyond the middle of the wing.

A fine series taken in May and June, at Chang-yang, Central China, and Omei-shan, Western China.

Allied to *M. acryva*, Oberth., but differing therefrom in the character of the marginal borders.

Metaporia (Pieris) hastata, Oberthür (Etud. d'Ent. xvi. p. 5, pl. i. fig. 6), from Yunnan, is very closely allied to *M. oberthuri* on the upper surface, but hardly separable from *M. lotis* on the under surface. It appears to be a

good species, but probably local as it was not met with by my collectors in any part of China visited by them.

Metaporia lotis. (Plate XXXVI. fig. 6, ♂.)

Pieris lotis, Leech, Entomologist, xxiii. p. 192 (1890).

Black with white markings; these on the primaries are very similar to *M. larraldei* (Oberth.

Etud. d'Entom. ii. p. 19, pl. i. fig. 2 *a, b*); the basal two thirds of secondaries are white, with a broad patch of black scales at the base and extending along the median nerve; there are no white or whitish submarginal spots on either primaries or secondaries, but the latter have a series of more or less lunulated spots on the outer margin. Under surface of primaries also similar to *M. larraldei* as regards the white markings, but the costa and apical third are pale yellowish; the latter is intersected by the black nervules and some thin black bifurcated streaks between them; secondaries are pale yellowish; neuration black, a bifurcated black streak in each nervular interspace. As in the same sex of *M. larraldei*, the female has the white markings suffused with greenish yellow.

Expanse, ♂ 74 millim., ♀ 78 millim.

Four male specimens taken in a marsh near Wa-shan, June; and two examples of each sex at Ta-chien-lu, July. I have also received it from Pu-tsu-fong and Moupin.

Metaporia aceræa.

Pieris aceræa, Oberthür, Bull. Soc. Ent. Fr. 1885, p. cexxvi; Etud. d'Entom. xi. p. 15, pl. ii. fig. 7 (1886).

“Rappelle beaucoup, par la taille et la forme allongée de ses ailes, l'*Aceræa tepsichora*, Linné, et se place, à cause de la disposition des dessins et des taches dont elle est ornée, dans le groupe de *sorocia*, *agathon*, *larraldei*, &c., mais ne peut être confondue avec aucune autre *Pieris*, tant ses ailes longues et étroites lui impriment un caractère particulier.

“En dessus, le fond des ailes est jaunâtre clair. Aux ailes supérieures, les dessins brun-noir sont, comme disposition, presque les mêmes que dans *larraldei* ♀ mais le contour intérieur en est beaucoup moins arrondi et plus aigu. Aux ailes inférieures, la bordure brun-noir n'est pas traversée au milieu par un rang de taches intra-nervurales, comme dans *larraldei*. Cette bordure, chez le *Pieris aceræa*, n'est éclaircie de blanchâtre qu'au contact du bord extérieur.

“Le dessous diffère du dessus parce que toutes les parties brun-noir sont atténuées et lavées de jaune, surtout au bord des supérieures et des inférieures, qui sont elles-mêmes plus lavées de jaunâtre que les supérieures et ornées d'une macule orangée située dans l'espace nervural basilaire. Les nervures, en dessous, sont finement écrites en noir.

“Les antennes, le corps et les pattes sont noirâtres. Le corps est recouvert d'une pilosité et d'un semis d'atomes jaunâtres.” (Oberthür, l. c.)

Oberthür states that he received this species from M. Biet, but does not mention the locality in which it was taken. My collectors did not meet with it in any part of China which they visited.

Metaporìa larraldei.

Pieris larraldei, Oberthür, Etud. d'Entom. ii. p. 19, pl. i. fig. 2 *a, b* (1876).

Pieris larraldei, var. *melania*, Oberthür, op. cit. xvi. p. 5, pl. i. fig. 5 (1892).

Pieris larraldei, var. *mutans*, Oberthür, l. c. p. 6, pl. i. fig. 3.

- “ Les ailes sont d'un blanc un peu verdâtre, avec tout le bord extérieur largement lavé de noir brun. Cette teinte noire, qui envahit les ailes supérieures jusqu'au tiers de la cellule discoïdale, est coupée par deux rangées de macules blanches, dont l'une suit le bord extérieur de l'aile; l'autre qui n'est d'abord pour ainsi dire qu'une seule tache divisée par les nervures, descend juste au-dessus de la cloison de la cellule discoïdale et se relie à la partie blanche partant de la base et que divisent aussi les nervures.
- “ Les ailes inférieures sont également bordées de noir; une série de taches blanches, dont le sommet est aigu, pénètre entre les nervures, vers le bord extérieur; ces taches blanches qui partent de la base même de l'aile, sont elles-mêmes divisées par une bande noirâtre parallèle à la frange, plus foncée à son point de départ et finissant en pupillation grisâtre un peu avant d'arriver à l'angle anal.
- “ Le dessous reproduit le dessus; mais le noir est moins velouté, moins foncé et un peu glacé. Les taches blanches sont plus nettement découpées sur le noir, et à l'aile inférieure, ainsi qu'au sommet de l'aile supérieure, elles sont lavées de jaune; les nervures sont toutes accompagnées d'un liséré noir assez large à l'aile inférieure. La tache basilaire à l'aile inférieure est d'un jaune orangé vif.
- “ Les antennes sont noires; l'abdomen blanc en dessous et noir en dessus, mais presque entièrement couvert de pupillations blanches.
- “ La femelle diffère du mâle par une plus grande taille et la couleur noire moins foncée.”
(*Oberthür, Etud. ii.*)

Male. Outer half of primaries black; basal half white, separated into four patches by the black submedian nerve, median nerve, and first branch; there is a short white band composed of three elongate spots from just beyond the middle of the costa and a submarginal series of white spots. Secondaries black with the discoidal cell and the abdominal margin white, a white longitudinal streak from base of costa to the first subcostal nerve and in each nervular interspace there is a long, broad, white streak terminating outwardly in an obtuse point and divided by a transverse band of the ground-colour. Under surface: primaries black marked with white as follows:—a broad stripe in the discoidal cell, another below in the submedian interspace, and an oblong spot in the first median fork; a curved series of seven elongate spots, three of these are near the costa and close together, two at outer angle also contiguous, and one in each median interspace; there are five yellowish tinged streaks on apical area; secondaries are white, more or less tinged with yellowish and with a yellow patch at the base; neurulation black, broadly bordered with the same colour and expanding on the outer margin; there is a broad curved black transverse band beyond the middle of the wing.

Female. Fuliginous with yellowish markings; there is rarely more than one submarginal spot on the primaries and this is placed in second median interspace, but sometimes there is a double spot at inner angle; the secondaries have four submarginal spots representing the outer portions of the streaks seen in the male. Under surface of primaries as in the male; the secondaries are yellow.

Expanse, ♂ 73–87 millim., ♀ 78–85 millim.

Var. **melania**, Oberthür. "A Mou-Pin, d'ou proviennent les exemplaires qui ont servi de type à la description et à la figure que j'ai publiées dans la II^e livraison des 'Etudes d'Entomologie,' la *Pieris larraldei* est d'un aspect bien différent de la forme de Ta-Tsien-Lou. Celle-ci est beaucoup plus obscure; les taches blanches sont rétrécies par l'envahissements des parties noires. En outre, la taille est généralement plus grande. De plus, la coloration des ailes inférieures en dessous est plus jaune.

"Ma collection renferme sept très beaux mâles de Ta-Tsien-Lou. Ils ne varient presque pas entre eux." (*Oberthür, Etud.* xvi.)

Var. **nutans**, Oberthür. "Ta-pin-tze (Yunnan), R. P. Delavay.

"Les ailes supérieures en dessus sont à peu près semblables à celles de *hastata*; mais les inférieures sont bien plus rembrunies.

"C'est par le dessous des ailes inférieures, où les taches jaunes sont tantôt plus claires et tantôt plus foncées, que *nutans* est bien distincte.

"L'espace basilaire est jaune orangé, au lieu d'être jaune citron comme chez *larraldei* et *hastata*; la première tache subbasilaire costale est blanchâtre; la tache allongée intranervurale, supérieure à la grande tache cellulaire, est jaune citron vif, tandis que la tache cellulaire est jaune nankin; les taches du bord anal sont jaune nankin pale; les taches submarginales sont jaune citron légèrement orangé, et les cinq taches qui entourent les cellules sont, comme la tache cellulaire, d'une teinte jaune plus claire.

"En outre, la forme de toutes ces taches jaunâtres est moins aiguë que dans les formes voisines." (*Oberthür, l. c.*)

In typical *M. larraldei* the white colour preponderates on all the wings, but in several examples the outer area of the wings is almost devoid of white markings (var. *melania*, Oberthür), and in some specimens from Ta-chien-lu the outer third is entirely black. M. Oberthür considers *melania* to be a form of *M. larraldei* peculiar to the neighbourhood of Ta-chien-lu. I received, however, both it and the type from Moupin as well as from Ta-chien-lu, and among the other specimens sent from each locality there were intergrades connecting the two forms.

None of my specimens of *M. larraldei* agree with Oberthür's var. *nutans* from Yunnan, which he compares with his *P. hastata* from the same locality, pointing out that the markings on the upper surface are deeper than in that species, whilst he says that *nutans* differs principally from the type of *larraldei* in the deeper yellow of the under surface of the secondaries.

Occurs commonly in May and June at Moupin, Ta-chien-lu, Wa-shan, Wa-ssu-kow, and Chia-kou-ho in Western China.

Metaporía goutellei.

Pieris goutellei, Oberthür, Etud. d'Entom. xi. p. 15, pl. ii. fig. 11 (1886).

"Blanc jaunâtre en dessus, avec toutes les nervures empâtées de noir, surtout vers le bord

extérieur des supérieures. Les ailes sont traversées par une bande noire extracellulaire, parallèle au bord extérieur, composée de traits cunéiformes intranervuraux dirigeant leur pointe vers le bord extérieur et très aigus. Ces traits cunéiformes ressortent sur une partie blanche ayant une forme analogue, mais plus atténuée. Le dessous reproduit le dessus; mais avec cette différence que tous les traits noirs, aussi bien ceux des nervures que ceux des cunéiformes de la ligne transversale, sont plus nettement écrits, moins empâtés, et qu'enfin l'apex des supérieures et toute la surface des inférieures sont lavés de jaune nankin.

“Les antennes et le corps sont noirs, sauf le dessous de l'abdomen qui est blanchâtre.

“La *Pieris gontellei* vient de Tsé-Kou.” (Oberthür, l. c.)

Male. White with black neuration. Primaries have a large black spot at the end of the discoidal cell; submarginal band black, generally well defined and more or less obscuring a series of intense black sagittate marks; the black borders of the nervules increase in width as they approach the outer margin; the submedian interspace is transversely divided by a fine blackish line which expands into a triangular blotch on outer margin. Secondaries have a submarginal series of fine black sagittate marks. Fringes dark grey preceded by a black line. Under surface: costa and neuration of primaries black, apical area yellow, a submarginal series of black arrow-heads; secondaries yellow with black sagittate marks as above.

Female with the markings as in the male but the primaries are suffused with blackish.

Expanse 65-70 millim.

Occurs at Ta-chien-lu and Wa-ssu-kow in Western China. The male is fairly common but the female is exceedingly rare. M. Oberthür's description applies only to the male.

Metaporia delavayi.

Pieris delavayi, Oberthür, Etud. d'Entom. xiii. p. 37, pl. ix fig. 97 (1890).

“Yunnan (*R. P. Delavay*).

“Appartient au group de *soacta*; plus grande, avec le sommet des ailes supérieures un peu plus arrondi. Le dessus des ailes est blanc, avec l'apex pupillé de noir, ainsi que l'extrémité de la cellule et des nervures des supérieures.

“En dessous l'apex des supérieures et la face des inférieures est jaune nankin; les nervures des inférieures surtout sont empâtées de noirâtre ardoisé; la cellule contient une fourche dont les deux branches se fondent dans une tache noirâtre qui s'étend des deux côtés de la nervure fermant la cellule. Un feston de croissants dont le sommet regarde vers la cellule et rencontre les nervures, s'appuie, au moyen de traits noirâtres, sur le bord externe des ailes.

“La contecture des ailes est mince et délicate.

“Les antennes et le corps sont noirs en dessus; les côtés de la poitrine en dessous sont couverts de poils blancs et le dessous de l'abdomen est blanc.”

Male. White, neuration blackish. Primaries have a black bar at end of discoidal cell and a black patch at apex. Under surface of secondaries creamy yellow; at the end of the discoidal cell, which contains a black bifurcate vein-like streak, there is a black bar, and beyond the middle the wing is traversed by a chain of dusky Y-like marks, the leg of each Y being continued to the outer margin; the apical area of primaries is creamy yellow, there is a black bar at the end of the cell and a short black dash from costa just beyond.

Expanse 67-85 millim.

This species, which bears a superficial resemblance to a gigantic *Aporia soraeta*, Moore, is fairly common at Wa-shan, Pu-tsu-fong, Chia-kou-ho, and How-kow in Western China. My collectors, however, failed to meet with the female.

Genus APORIA.

Aporia, Hübner, Verz. bek. Schmett. (1816).

Pontia, Fabricius, Butler, Cist. Entom. i. p. 50 (1870).

- “*Front wings* subtriangular or subpyriform; second subcostal emitted close to end of cell; discocellulars more or less oblique and varying in relative length; median branches generally emitted at nearly equal distances from each other.
- “*Hind wings* pyriform; cell more elongate than in preceding genus [*Belenois*, Hübn.]; discocellulars oblique, the upper nearly equal to lower in type; the same also applies to the distance between median branches.
- “*Palpi* densely hairy. Antennæ with compressed club; abdomen without anal hooks. Type *A. cratergi*.” (Butler, l. c.)

Aporia dubernardi. (Plate XXXVI. fig. 8, ♀.)

Pieris dubernardi, Oberthür, Etud. d'Entom. ix. p. 13, pl. i. fig. 6 (1884).

- “Ailes blanches avec le bord costal des supérieures noir, ainsi que l'apex et le bord externe, le long duquel les parties noires, outre qu'elles sont plus foncées au voisinage de chaque nervure, forment une sorte de feston dont la partie la plus saillante joint la nervure, tandis que la plus creuse se trouve au milieu de l'espace intranervural. La cellule discoidale est empatée de noir. Les cinquième et sixième espaces intranervuraux contiennent, entre la cellule discoidale et le bord extérieur, une tache noire plus grosse dans le cinquième.
- “Le bord externe des inférieures est liséré finement de noir; le contact des nervures et du bord externe est marqué d'une petite tache triangulaire noirâtre et les espaces intranervuraux, entre la cellule discoidale et le bord externe, sont marqués de taches noires plus ou moins accentuées, mais qui paraissent surtout dans les espaces premier, deuxième et quatrième, parallèlement au bord externe. La base des ailes est marquée de noirâtre.
- “En dessous les ailes supérieures sont blanches avec l'apex jaunâtre, et les ailes inférieures jaune canari et naikin, notamment le long du bord externe. L'espace basilaire est jaune orangé. Aux quatre ailes, les nervures sont empatées de noir, mais surtout aux inférieurs. Les taches noires intranervurales, parallèles au bord externe, sont reproduites et forment aux inférieures, dans l'empâtement nervural, comme une ligne régulière.
- “Les antennes sont annelées et comme tressées de blanc et de noir, ce que la figure dessinée par M. d'Aprial ne représente malheureusement pas. Le voisinage du corps est assez velu, ainsi que la surface de l'aile inférieure en dessous, surtout près de la base.
- “Découverte à Tschou par M. l'abbé Dubernard.” (Oberthür, l. c.)

Male. White, venation blackish. Primaries have a triangular black mark on the costa which unites with a heavy black bar at the end of the discoidal cell; there is an elongate black spot on the disc intersected by the second median nervule, and this is generally connected with the bar at end of cell by a diffuse black streak from its upper edge along the third median

nerve: there is a series of triangular black spots on outer margin placed on the nervules, their bases united and the apical ones more or less confluent. Secondaries have a black bar at end of cell, a submarginal series of black spots extending from costa to second median interspace and a series of small triangular black spots on outer margin, placed on the nervules and united by a black marginal line. Fringes of primaries black except towards inner angle, where they are greyish as are those of secondaries. Under surface: venation broadly black: apex of primaries yellow; secondaries yellow, the area beyond the blackish submarginal band and also the abdominal margin paler; there is a patch of deeper yellow at the base of costa, and one below median nervure.

Female. Black markings more pronounced; all the wings are traversed by a black band and are suffused with black on the basal area. Under surface similar to that of the male but the secondaries are rather whiter.

Expanse, ♂ 70 millim., ♀ 68 millim.

The female of *P. dubernardi*, which has not been previously described, appears to be scarce, but the male seems to be common from May to July at high elevations in the neighbourhood of Ta-chien-lu, Ni-tou, Wa-ssu-kow, and Chow-pin-sa, Western China. M. Oberthür's type was from Tsékou.

Referring to this species, Mr. Elwes says, in his "Catalogue of the Lepidoptera of Sikkim" (Trans. Ent. Soc. Lond. 1888, p. 415):—"This species is only known to me from some eight or nine specimens which were brought by a native employed by the late Capt. Harman, R.E., in surveying the Thibetan frontier, and may not occur on this side of the passes."

Aporia davidis. (Plate XXXVI. figs. 1 ♀, 3 var.)

Pieris davidis, Oberthür, Etud. d'Entom. ii. p. 18, pl. i. fig. 5, ♂ (1876); Leech, Entomologist, xxiv., Suppl. p. 57, ♀ (June 1891).

Pieris davidis, var. *venata*, Leech, l. c. p. 58.

Pieris davidina, Oberthür, Etud. d'Entom. xv. p. 8, pl. iii. fig. 20 (July nec June, 1891).

"En dessous, les ailes supérieures sont blanches, avec le sommet lavé d'un peu de jaune plus ou moins nankin ou canari. Les nervures sont noires, sur un trait brun plus ou moins large. Des atomes noirs sont saupoudrés dans l'intérieur de la cellule discoïdale et çà et là entre les nervures. Les ailes inférieures sont jaune paille ou jaune vif, avec toutes les nervures assez largement empâtées de brun ou de noir ardoisé. Dans l'intérieur de la cellule discoïdale sont même un ou deux traits longitudinaux de la couleur de ceux qui bordent les nervures. La frange, les antennes, les pattes sont noires. Je possède cependant un exemplaire où la frange brune à la base est ensuite blanchâtre." (*Oberthür, l. c.*)

Male. White with the venation blackish. Primaries black at the base; submarginal band broad, black, and not continued beyond the first median nervule. Secondaries black at the base and along the median nervure as far as the first branch; there is sometimes a black spot at outer angle. Fringe pale greyish preceded on all the wings by a fine black line. Under surface: the venation is more broadly black than above; primaries are tinged with pale

yellow at the apex, and the secondaries are entirely of this colour with a patch of darker yellow at the base of costa and below the median nerve.

Female. Primaries almost entirely black, suffused about the disc with greyish scales; there is a series of white blotches along the outer margin and also white longitudinal patches at the extremity of the cell, the first being situated near the costa; in other respects the female does not differ from the male, except in size.

Expanse, ♂ 58-68 millim., ♀ 65 millim.

I have only one example of the female. It was taken with males at an elevation of over 8000 feet at Ta-chien-lu in June.

Var. **venata**, Lecch. (Plate XXXVI, fig. 3, ♀.) Except that the black submarginal band of primaries is often continued to the submedian nerve, the male agrees on the upper surface with typical *A. davidis*; the female is less suffused with black. On the under surface, in both sexes, the secondaries and the tips of primaries are rich lemon-yellow and the venation is broadly bordered with black; the fringes are usually black, but in some specimens they are not darker than in typical *A. davidis*.

Expanse, ♂ 59 millim., ♀ 55 millim.

This form, which at first sight seems to be a distinct species, occurs in the same localities as typical *A. davidis*, and is probably a seasonal variety. In one large male specimen from Chow-pin-sa there are two black nerve-like streaks in the discoidal cell of each wing and a similar one in the submedian interspace of primaries; these streaks are visible on both surfaces, but are most distinct above; the apical area of primaries is thickly dusted with blackish.

Var. *venata* is identical with *P. davidina*, Oberthür, of which the following is the original description:—

“En dessous, les ailes supérieures de *davidina* sont plus empâtées de noir vers le bord extérieur, et les nervures des inférieures sont également plus largement noircies au contact du bord extérieur.

“Le même empatement melanien se remarque en dessous; mais l’apex et la face tout entière des ailes inférieures y sont lavées de jaune canari assez vif, au lieu de jaune nankin pale; de plus l’empatement nervural est d’un noir ardoisé tendant plutôt à l’indigo bleuâtre qu’au brun sur les ailes inférieures, alors que la nuance reste brun noir aux supérieures. Près de la base des ailes inférieures et assez loin vers le milieu des ailes, il y a une pilosité blanchâtre relativement longue et épaisse.

“La frange dans *davidina* est noire; elle est blanche dans *davidis*, sauf en remontant vers l’angle apical des ailes supérieures où elle tend à noircir.” (Oberthür, *l. c.*)

Occurs at Ta-chien-lu, Omci-shan, Ni-tou, and Chow-pin-sa, always at high elevations.

Aporia procris. (Plate XXXIII, fig. 10, ♂.)

Aporia procris, Lecch, Entomologist, xxiii. p. 191 (1890).

Pteris halisca, Oberthür, Etud. d’Entom. xv. p. 7, pl. iii. fig. 23 (1891).

Male. Yellowish white, with the neuration black and conspicuous; submarginal line of primaries dentate, extending to first median nervule; on the secondaries there are indications of bifurcated streaks between the nervules. Under surface of primaries whitish, costa and apex yellowish; secondaries yellow, with a patch of orange at base; neuration and lines as above. Expanse 25 millim.

Allied to *A. soracta*, Moore, but differs therefrom in colour and in the absence of black patch beyond discoidal cell. It is perhaps most readily distinguished by the black neuration.

Fresh specimens are more brightly tinted with yellow than worn examples.

Appears to be a very rare species; I have only received six specimens from Ta-chien-lu and two from Ni-tou. These are all males and were taken in July at a considerable elevation. M. Oberthür also describes a male specimen of this species from Ta-chien-lu, under the name *Pieris halisca*, and compares it with *P. leucodice*, Eversmann, but I consider it is more nearly allied to *A. soracta*, Moore.

Aporia martineti.

Pieris martineti, Oberthür, Etud. d'Entom. ix. p. 12, pl. i. fig. 5, ♂ (1884), xiii. p. 38, pl. ix. fig. 98, ♀ (1890).

Pieris martineti, var. *kreitneri*, Frivaldsky, Term. Füz. x. p. 39, pl. iv. fig. 2 (1886).

.. Voisine d'*hippia*; mais tout à fait distincte par la forme plus étroite des ailes, la couleur blanche en dessus plus opaque et plus vive, les traits nervuraux noirs plus nets et la nervulation, notamment en ce qui concerne la direction et la position comparative des deux premiers rameaux nervuraux de l'aile inférieure et la forme de la cellule discoidale.

.. En dessous, la *Pieris martineti* a, comme en dessus, toutes les couleurs, blanche de l'aile supérieure, jaune de l'aile inférieure et noire des nervures bien vives et nettes. L'apex des ailes supérieures est jaune canari et la teinte jaune des inférieures n'est pas un lavis uniforme; mais dans la cellule discoidale et un peu au-dessus du bord externe, on remarque des éclaircies d'un nankin pale.

.. Les antennes sont noires; le corps et les pattes sont assez velus, noirs avec des touffes de poils jaunâtres." (*Oberthür, Etud.* ix.)

.. Les femelles des *Pieris bieti* et *martineti* sont très différentes entre elles. *Bieti* femelle a les ailes transparentes et les nervures ne sont pas sensiblement empâtées de noir, tandis que *martineti* femelle a le fond des ailes plus opaque, blanc ou jaunâtre, avec les nervures très largement empâtées de gris noirâtre. L'individu figuré dans cet ouvrage a été envoyé de Yunnan par M. le R. P. Delavay.

.. La *Pieris bieti* se trouve aussi au Yunnan. Elle y est blanche et plus grande qu'à Ta-Tsien-Lou. Le type de Bathang est aussi clair, mais moins grand." (*Oberthür, Etud.* xiii.)

Male. Resembles the same sex of *A. hippia*, but all the wings, especially the secondaries, are black at the base; the spot at end of discoidal cell of primaries is narrower and more intensely black; the black borders of the nervules commence farther from the outer

margin and increase in width more gradually; the submedian nervure is straighter. Fringes black. On the under surface the apical area and costa of primaries are tinged with yellow; the secondaries are yellow marked with whitish at the base of the costal nervure, along upper portion of discoidal cell, and between some of the nervules; the venation is heavily bordered with black. Body and legs very black.

Female well clothed with scales on all the wings. White, sometimes tinged with yellowish: the veins are broadly bordered with black. Under surface similar to that of the male, but the veins of primaries are bordered with black throughout their length, and the white markings on secondaries are more clearly defined.

Expanse 60-63 millim.

Both sexes occur, not uncommonly, at high elevations in June and July at Ta-chien-lu, Western China. Oberthür figures a female from Yunnan and Frivaldsky describes and figures var. *kreitneri* from Koko-noor.

Aporia hippia. (Plate XXXVI. fig. 2, var.)

Pieris hippia, Bremer, Bull. Acad. Pet. iii. p. 464 (1861); Lep. Ost-Sib. p. 7, pl. iii. fig. 1 (1864).

Aporia hippia, Lang, Butt. Eur. p. 67 (1884).

Leuconea cratagioides, Lucas, Ann. Soc. Ent. Fr. 1865, p. 503, pl. xi. fig. 11.

Leuconea hippia, Lucas, op. cit. 1867, p. v.

Pieris bieti, Oberthür, Etud. d'Entom. ix. p. 12, pl. i. figs. 7 ♂, 8 ♀ (1884).

"Alæ albæ, nigro nervosæ; posticæ subtus flavescentes, macula basali flavâ. 55-70 millim."
(Bremer, l. c.)

"Slightly smaller than *A. cratagi*. The hind wings are straighter and more oblong. The fore-wings have the nervures shaded with black; beneath, the apices are tinted with yellowish. The hind wings resemble those of *cratagi* above, but beneath they have the nervures very much extended, or shaded with black; at the base is a patch of bright orange-yellow."
(Lang, l. c.)

Graeser (Berl. ent. Zeit. 1888, p. 66) states that he found larvæ of *A. hippia* commonly in webs on all the bushes of *Berberis sinensis* and *B. amurensis* in the neighbourhood of Vladivostock. He writes:—"The larvæ were sent by me in large numbers to Europe during the winters of 1884 and 1885 and were there bred. I need not give any description as the larva can easily be distinguished. Its life-history is exactly like that of *A. cratagi* and passes the winter in the same way, several together in a close web."

Var. *bieti*. "Du group de *soracta*, *davidis*, *hippia*, &c. Taille de *soracta*; ailes du mâle d'un blanc un peu jaunâtre en dessus avec les nervures des supérieures très accentuées et empatées d'un trait brun noirâtre, large surtout au voisinage du bord externe; les nervures des inférieures paraissent plutôt par transparence du dessous, sauf au voisinage du bord externe et le long du bord antérieur où elles sont un peu empatées de noir.

- “ En dessous, ailes supérieures blanc jaunâtre avec l'apex d'un jaune canari et l'empatement noir nervural, au milieu des ailes, au lieu d'être au bord extérieur comme en dessus. Ailes inférieures d'un jaune canari vif avec les nervures noires saillantes sur un filet noir, très net, pas large et assez vif. L'espace basilaire compris dans l'angle nervural est d'un jaune plus foncé que le fond des ailes.
- “ Le mâle varie pour la couleur des ailes qui, dans quelques individus, est d'un jaune soufre en dessus. J'ai appelé cette aberration, qui est constante et commune à beaucoup de *Pierides* blanches, *sulphurea*.
- “ Le mâle varie encore pour le semis d'atomes noirs qui dans d'autres individus couvre la base et le milieu des ailes supérieures. J'ai appelé cette autre aberration, qui est également constante, *fumosa*.
- “ Dans la femelle les écailles des ailes sont moins adhérentes que chez le mâle, et les cinq exemplaires que je possède de ce sexe femelle, ont tous un ton luisant résultant de ce que les ailes supérieures surtout sont comme hyalines. Cependant un semis d'écailles blanc jaunâtre persiste dans le milieu de chaque espace nervural.
- “ Découvert à Ta-Tsien-Lou par Mgr. Biet.” (*Oberthür, l. c.*)

Alphéraky (Rom. sur Léop. v. p. 96) remarks that after carefully comparing a number of specimens of *A. hippia* from different localities with typical specimens of *bieti*, Oberthür, from Ta-chien-lu, and also with seventeen examples taken by Potanine in North China and Mongolia, he arrived at the conclusion that *bieti* was not specifically distinct from *hippia* but only a well-marked form of that species. Potanine's specimens, he says, differ from Ta-chien-lu examples in having the wings broader in proportion to their length and in the nervures being less heavily bordered with black, and are intermediate between *bieti* and typical *hippia*.

According to Staudinger (Rom. sur Léop. vi. p. 140), *A. hippia* is common on the Ussuri and throughout the whole of Southern Amurland. Staudinger also states that the species is peculiar to Amurland, thus implying that it had never occurred elsewhere. It would seem therefore that he was not aware of the fact that *cratagjoïdes*, Lucas, from Pekin, is synonymous with *A. hippia*.

Oberthür (Étud. d'Entom. v. p. 12) records *hippia* from Askold.

The *bieti* form of this species appears to be exceedingly common in Western China. The specimens vary considerably in size, some examples are much suffused with blackish about the base of the wing (var. *fumosa*, Oberthür); a few are tinged with yellow (var. *sulphurea*, Oberthür); a specimen of the latter form is figured (Plate XXXVI. fig. 2, ♂). I have a long series of *A. hippia* from Amurland, and I find there is considerable aberration in the neurcation of the females, e. g. the second subcostal nervule of secondaries is sometimes bifurcate on the outer margin of the wing. In some specimens

the discoidal nervule is united by a short veinlet with the second subcostal nervule, forming a secondary cell on the hind wings, sometimes this occurs on one wing only. The fifth subcostal branch of primaries is in one specimen independent, and as its point of origin is from the upper discocellular it is really equivalent to a discoidal nervule.

Distribution. Amurland, the Ussuri, Mongolia, North and Western China.

Aporia cratægi.

Papilio cratægi, Linnæus, Syst. Nat. i. 2, p. 758 (1767).

Aporia cratægi, Lang, Butt. Eur. p. 27, pl. vi. fig. 1 (1881); Pryer, Rhop. Nihon. p. 5, pl. iii. fig. 7 (1886).

- “ Expands 1.75 to 2.50 in. All the wings are white, more or less diaphanous, more so in the female than the male, without marginal fringe. The nervures are very distinct, and generally have at their marginal ends triangular patches of blackish scales. Antennæ black. Head, thorax, and abdomen of the same colour, and slightly downy.
- “ *Larva* covered with a white down, with the sides and ventral surface lead-coloured. The dorsal surface marked with two longitudinal yellowish bands. Feeds in company on the hawthorn, sloe, wild cherry, and other fruit trees. Sometimes very destructive to orchards.
- “ *Pupa* greenish white, with two lateral yellow lines, and numerous black points. The larva appears in the spring.” (*Lang, l. c.*)

The early stages of this species are figured in Buckler's 'Larvæ of British Butterflies.'

Common in the Island of Yesso, whence the specimens are larger than European examples, and the females are very thinly clothed with scales which gives them a very transparent appearance. The species does not seem to occur in any other part of Japan.

Examples from Chang-yang, Central China, are typical, but those from Ta-chien-lu and Ni-tou in Western China are smaller than European specimens; the wings are broader and the under surface of secondaries is closely sprinkled with black scales.

According to Staudinger (Rom. sur Léop. vi. p. 140), the species is common throughout Amurland, and he states that Herz obtained it in China to the north of Peking. Alphéraky (op. cit. v. p. 95) records it from several localities in North-western China and Mongolia, and Oberthür, in the fifth part of his Etudes, mentions it from the Isle of Askold.

Distribution. Europe, Siberia, Amurland, China, Mongolia, Japan.

Genus DAVIDINA.

Davidina, Oberthür, Etud. d'Entom. iv. pp. 19, 108 (1879).

“♂. Antennes courtes à massue assez épaisse; palpes saillants; corps et abdomen grêles; ailes entières, rondes, à nervures saillants, dont une fourchue dans l'intérieur de chaque cellule discoïdale.” (*Oberthür, l. c.*)

Davidina armandi. (Plate XXXIII. fig. 9, ♂.)

Davidina armandi, Oberthür, Etud. d'Entom. iv. pp. 19, 108, pl. ii. fig. 1 (1879).

“Aux caractères génériques précités, j'ajouterais que les ailes sont d'un blanc jaunâtre avec le bord rembruni, surtout aux supérieures. Tous les espaces intranervuraux sont marqués sur le pli d'un trait court, noir. Les épaulettes sont blanches. Le dessous ne diffère du dessus que par l'absence, le long du bord des ailes, des atomes bruns qui sont remplacés par une teinte légèrement plus jaunâtre que le fond blanchâtre des ailes, et par une raie large sinueuse d'atomes brunâtres qui traverse les ailes inférieures par le milieu, du bord antérieur au bord anal.

“Je ne connais que le mâle.

“M. l'abbé David a capturé la *Davidina armandi* au sommet du Pé-Hoa-Chan, sur les plateaux les plus élevés des montagnes qui se trouvent à trente lieues au nord-ouest de Pékin. Le papillon vole en plein été, pas très haut au-dessus de terre et avec une allure rappelant le vol des *Parassius*, sur les pentes et autour des rochers qui couronnent les cimes des montagnes Sihan. Les brouillards entourent presque constamment les hauteurs où vit la *Davidina armandi*.” (*Oberthür, l. c.*)

I have only received four examples of this interesting species (two males and two females); these were taken at a considerable elevation in the neighbourhood of Chang-yang, Central China. Except that the males are more suffused with black on the margins of all the wings, the sexes do not differ in appearance. The ground-colour of all my specimens is more ochreous, and the neuration more broadly black than in M. Oberthür's figure; the fringes are also black.

M. Grun-Grshimailo sent me specimens of *Mesapia peloria*, Hewitson, from Ando. This insect bears a superficial resemblance to *D. armandi*, but has not yet been met with in the region here dealt with.

Genus TACHYRIS.

Tachyris, Wallace, Trans. Ent. Soc. Lond. (3) iv. p. 361 (1867).

“Head moderate, palpi long, acutely pointed; antennæ of moderate length, terminating in a slender club; thorax stout; abdomen slender. Anal valves of the male elongated and provided with a tuft of long and stiff hairs at each side of the base beneath.

“Upper wings with the apex acute or much produced, two subcostal nervules given off before

the end of the cell, the third of moderate length or very short, and in some species quite wanting; upper radial as a branch of the subcostal at some distance beyond the cell. Sexes often differing widely.

“Larva hairy, with four or six longitudinal rows of spines; pupa with two lateral spines.

“This genus does not differ materially in neuration from *Pieris*, but the remarkable character of the strong tufts of hair at the anal valves of the males enables us to bring together a number of allied forms, which, wherever the male is obtained, can be referred to the genus with the greatest certainty. Most of the species fly swiftly, and many of the males assemble in troops about wet places and on river margins after the manner of the genus *Callidryas*.” (Wallace, *l. c.*)

Tachyris paulina.

Papilio paulina, Cramer, Pap. Exot. ii. pl. ex. figs. E, F (1779).

Tachyris paulina, Wallace, Trans. Ent. Soc. Lond. (3) iv. p. 369 (1867); Elwes, Trans. Ent. Soc. Lond. 1888, p. 419.

Male. White bordered with black. Primaries have the basal area blackish from the submedian nervule to the costa, which is broadly bordered with black as also is the outer margin, the latter, which encloses two large white subapical spots and two smaller ones below, has its inner edge deeply bidentate. Secondaries tinged with yellowish at the base and along costal area; the outer margin has an internally dentate black border. Under surface shining white; the primaries yellow on basal area and traversed by an angulated black band which originates from a black streak on the costa and terminates in a black patch at inner angle.

My collectors only obtained one example of this species. It was captured at Ta-chien-lu in July.

This specimen differs from Cramer's figures in being blacker on the basal area of primaries and in the two lower white spots being smaller on those wings, the black border of secondaries is narrower and the black band on under surface of primaries is more angulated and much narrower.

The species is common in India and is found at low elevations in Sikkim.

Genus ANTHOCHARIS.

Anthocharis, Boisduval, Sp. Gén. i. p. 556 (1836); Doubleday, Gen. Diurn. Lep. i. p. 55 (1847).

Euchloë, Hübner, Verz. bek. Schmett, p. 94 (1816); Kirby, Cat. Diurn. Lep. p. 505 (1871).

“HEAD rather small, clothed with long hairs.

“EYES round, rather large, and prominent.

- “ *Labial palpi* longer than the head. Basal joint subcylindrical, more or less curved at the base: second joint subcylindrical; or elongate, ovate: third joint about one third the length of the second, slender, subcylindrical, pointed: or obovate, pointed.
- “ *Antennæ* rather short, terminating in an ovate compressed club, sometimes rather elongate.
- “ **THORAX** moderately stout, clothed with long fine hair.
- “ *Anterior wings* subtriangular, rounded externally, or falcate. Subcostal nervule four or five branched. First discoidal nervule united for some distance beyond the cell to the subcostal nervule. Lower discocellular nervule rather long, curved.
- “ *Posterior wings* obovate, the abdominal channel sometimes not much developed. Precostal nervule simple. Discoidal nervule appearing to be a third subcostal nervule.
- “ *Legs* rather slender. Claws very deeply bifid. Paronychia lanceolate, not so long as the claws. Pulvillus jointed, generally as long as, or longer than, the claws. The basal joint sometimes slender and very long.
- “ **ABDOMEN** rather elongate, often nearly as long as the abdominal margin of the wings, slender.
- “ **LARVA** slender, tapering considerably towards each extremity, pubescent.
- “ **PUPA** elongate, navicular, much arched, very pointed at each extremity, slightly keeled down the back; the segments of the abdomen not movable.
- “ *Anthocharis* is easily distinguished from *Pieris* by its palpi, which have the last joint very short, and also by the very different form of the pupa.
- “ The habits of this genus much resemble those of *Pieris*, but the flight of the European species is stronger and more rapid.
- “ The Larvæ, as far as known, live on various cruciferous plants, and are more slender than those of the Pieridæ.
- “ The Pupæ are remarkable for their elongate form, pointed at each extremity, and differ from those of *Pieris* in not being tuberculate at the sides, and in having the abdominal segments immovable.” (*Doubleday, l. c.*)

Anthocharis cardamines.

Papilio cardamines, Linnaeus, Syst. Nat. i. 2, p. 761 (1767).

Euchloë cardamines, Lang, Butt. Eur. p. 39, pl. ix. fig. I (1884).

Anthocharis cardamines, var. *thibetana*, Oberthür, Etud. d'Entom. xi. p. 16 (1886).

- “ Expands from 1.50 to 2.00 in. Wings white, rounded. The male has the fore wings white, with a black tip and a black discoidal spot: a large patch of brilliant orange reaches from the tip of the wing to considerably within the discoidal spot. Hind wings white and unspotted, but exhibiting traces of the pattern of the underside. Underside:—Fore wings white, yellowish at the base, and having the orange patch tipped with greenish grey and white. Hind wings white, marbled with irregular patches of yellow and black scales so mixed as to produce the effect of a beautiful green; these patches follow more or less the course of the nervures. Female similar to the male, but without the orange patch, and the tips of the wings are marked more strongly with black.
- “ *Larva*. Green, finely speckled with black, with a white lateral stripe less clearly defined at its dorsal than at its ventral edge. It feeds on various field Crucifera, including *Cardamine pratensis*, the pods generally forming its principal food.

"Pupa. Boat-shaped, at first green, but changing to greyish yellow, with clearer stripes. The eggs are laid in the summer, and the larva changes to a chrysalis in July, hibernating in this state." (*Lang, l. c.*)

A more extended account of the earlier stages of this species will be found in Buckler's 'Larvæ Brit. Butt.'

Var. **thibetana**, Oberthür. "Diffère du type européen parce que les ailes inférieures sont lavées de jaune soutre sur les nervures.

"Parait commun à Ta-Tsien-Lou." (*Oberthür, l. c.*)

In this form of *A. cardamines*, which is very common in Western China at Ta-chien-lu, Pu-tsu-fong, and Wa-ssu-kow, the male has the secondaries more or less suffused with sulphurous, especially about the nerves (I have examples similar in this respect from Greece and Asia Minor); the dark apex of primaries is much suffused with orange scales. In the female the apical black marking does not extend to the margin (this is also the case in some of my Syrian specimens of the same sex). The most important characters of *thibetana* are the broader wings and much longer chequered fringes which give the wings the appearance of being scalloped towards apex.

Graeser (*Berl. ent. Zeit.* 1888, p. 68) states that *A. cardamines* is fairly plentiful in the neighbourhood of Nicolajefsk, Amurland, in July. The females agree with European examples. In the males the black discoidal spot is either only faintly indicated or entirely absent; the orange colour extends much further inwards than in European specimens, occupying in some individuals almost two thirds of the primaries, and extending along the inner margin nearly to the middle of the wing. On the under surface the space between the orange colour and the base of the wing is much more brightly tinged with yellow. I have seen an example of this form in Mr. Elwes' collection and it seems to be a transition between *A. cardamines* and *A. bambusarum*.

Staudinger (*Rom. sur Léop.* vi. p. 142) mentions that Radde captured this species in the Bureja Mountains and that Schrenck met with it from Marinski to Nicolajefsk. He states that he has never received specimens from Amurland, and this may account for the fact that he does not make any remarks on the difference between Amurland and European examples.

Alphéraky (*Rom. sur Léop.* v. p. 100) records a female *A. cardamines* from Mongolia, but states that the specimen may possibly be a female of *A. bambusarum*, Oberthür, which he says had hitherto only been recorded from

Moupin and Japan. I am quite unable to find any particulars of the occurrence of *bambusarum* in either of these localities.

Distribution. Europe, Northern and Western Asia, Asia Minor, Amurland, Mongolia, Western China.

Anthocharis bambusarum.

Anthocharis bambusarum, Oberthür, Etud. d'Entom. ii. p. 20, pl. iii. fig. 4 (1876).

"Cette charmante espèce vole en avril dans les bambouscraies du Tché-Kiang ('Journal du 3^e voyage de l'abbé Arm. David dans l'Empire chinois,' pp. 24 et 25).

"Les ailes supérieures sont entièrement aurores, tant en dessus qu'en dessous; les ailes inférieures sont blanches en dessus; en dessous, elles sont marbrées de verdâtre comme dans *A. cardamines*.

"Cette dernière espèce, que l'*Anth. bambusarum* remplace au Tché-Kiang, se trouve dans le Thibet oriental, où M. l'abbé A. David en a pris un exemplaire dans les montagnes, à 3000 mètres d'altitude.

"Je ne possède qu'un exemplaire de l'*Anth. bambusarum*. C'est le seul, du reste, que M. l'abbé David ait rapporté. Il était serré dans un livre, tout aplati, mais très-entier cependant." (Oberthür, l. c.)

Possibly *A. bambusarum* may be a local race of *A. cardamines*, but it is distinguished by the more rounded apex of primaries, the duller orange colour above, and the different arrangement of the greenish markings on the under surface of secondaries.

I am indebted to M. Oberthür for an example from Léon-fang, this differs from the specimen figured by him in having a pyriform, instead of a bar-like, black discoidal spot. In Oberthür's figure the median nervure and first branch of primaries are black, forming a <-shaped mark, and these wings are entirely orange as far as the black basal patch. The Léon-fang specimen is without the <- mark and there is a white space between the basal patch and the orange colour.

Occurs in Tché-Kiang and at Léon-fang, and Mr. W. B. Pryer records it from the Snowy Valley, Ningpo.

Anthocharis bieti.

Anthocharis bieti, Oberthür, Etud. d'Entom. ix. p. 14, pl. i. fig. 1, ♀ (1884), xi. p. 16, pl. vi. fig. 39, ♂ (1886); Alphéraky, Rom. sur Léop. v. p. 72 (1889).

"Charmante Pieride du groupe de *scolymus* et *gentia*, ayant à peu près la forme et la taille de cette dernière espèce, dont elle diffère surtout par l'apex de ses ailes supérieures et le dessous de ses ailes inférieures.

"Le mâle diffère de la femelle par une petite tache subapicale aurore circonscrite entre le bord

costal, le point noir cellulaire, une ombre noirâtre intranervurale et la partie saillante de l'apex qui reste blanche. La femelle a en outre un lavis orange pâle sur l'aile inférieure en dessus. L'aile inférieure en dessous est ornée de petites taches formées d'atomes bruns couverts d'un lavis d'un jaune un peu orange. Ces taches brunes sont interrompues au delà de la cellule discoidale par une éclaircie toute blanche, parallèle au bord extérieur; le long du bord extérieur, les taches reparaissent sous forme d'une sorte de feston dont les dents correspondent aux nervures et la partie concave aux espaces intranervuraux. La frange est blanche, longue et soyeuse."

Male. Primaries are blackish at the base and have a broad subapical orange patch bordered inwardly by the large black spot which closes the discoidal cell, and a diffused blackish streak running from the spot towards outer margin; the apex is produced, and this portion of the wing is often more or less sprinkled with dark greyish scales, especially along the course of the nervules; the median nervule are blackish towards outer margin, the third often throughout its length. Secondaries white, sometimes tinged with yellowish, blackish at base and along the nervures: the pattern of the under surface shows through faintly. Under surface white; primaries have the orange subapical patch black and discoidal spot fainter than above; secondaries have the veins marked out with yellow and are traversed by irregular greenish bands; on the outer margin the nervules are bordered on each side with greenish.

Female has no orange subapical patch, but is otherwise similar to the male; the space, however, between second and third nervules is sometimes filled up with blackish scales. Expanse 48-52 millim.

This species was discovered by Mgr. Biet in the neighbourhood of Tachien-lu, and my collectors obtained large numbers of both sexes there in May and June. They did not, however, meet with it in any other locality.

Alphéraky records specimens from North-eastern Thibet and Grum-Grshimailo captured examples in Amdo.

Anthocharis scolymus.

Anthocharis scolymus, Butler, Journ. Linn. Soc., Zool. ix. p. 52 (1866); Pryer, Rhop. Nihon. p. 6, pl. iii. figs. 1a, 4b (1886).

Anthocharis thunbergii, De l'Orza, Lep. Jap. p. 14 (1869).

"♂. *Ala antice* elongate, costa ad venæ costalis finem directa, apice falcato; margine postico obliquo, sub unco sinuato; margine anali convexo; supra niveæ, basi costaque apicali cinereis, apice nigro maculis quatuor luteis interrupto, tertia permagna, alteris minimis, cella macula elongata reniformi nigra terminata.

"*Ala postice* piriformes, supra niveæ notis inconspicuis per alas indicatis, macula nigra in costa apicali, venis nigro acuminatis.

"*Corpus* fuscum; capite olivaceo pilosato.

"*Ala antice* subtus viridi pro fusco cinereoque, maculis albis nec luteis, aliter velut supra. *Ala postice* virides, maculis albis valde irregularibus variegatæ, margine postico pallidiorè, maculis marginalibus hastatis inter venas dispositis.

"*Corpus* cinereum, viridi pilosatum.

"*Alar. exp. unc.* 2 $\frac{1}{4}$.

"Most closely allied to *Anthocharis gentia*, Bd. (United States), but very distinct." (Butler, l. c.)

Male. White. Primaries have a large black oblong spot at end of discoidal cell; the apex, which is much produced, and acuminate, is marked with black, the apical fourth of the wing is pale orange with a large black spot on the costa and a similar one on outer margin, that on the costa frequently unites with the black markings of the apex, forming a broad streak along this portion of the costa; the base of the wing is blackish grey. Secondaries have the pattern of the under surface faintly showing through. Under surface of primaries white, marked with pale olive-grey along the costa and on apical area, the latter has also two patches of darker olive; discoidal spot as above; secondaries white, mottled with pale olive-grey over the whole wing, with two white-spotted dark olive patches from costa and others along the course of the median and submedian nervures; none of these dark markings invade the outer third of the wing, but the pale olive-grey markings are often heavier on this area; the outer margin is narrowly white interrupted at the ends of the nervules with dark olive.

Female. Similar to the male, but the orange on apical fourth is usually absent, although in some specimens it is faintly exhibited.

Expanse, ♂ 45-52 millim., ♀ 42-60 millim.

Pryer remarks:—"this insect undoubtedly only appears once during the year. There are no allied forms, and it is the only representative of the genus in Japan. I know little or nothing concerning its life-history beyond the fact that the larva feeds upon a bitter cress, common in marshy situations."

Appears to be a common species throughout Japan. It is recorded from Shanghai, and I have received several specimens from Chang-yang, Central China, and from the province of Kwei-chow, Western China. In some of the female specimens from Japan there are distinct indications of the orange patch of the male. The Western-Chinese examples are rather smaller than those from Japan.

Distribution. Japan, Western and Central China.

Genus LEUCOPHASIA.

Leucophasia, Stephens, Ill. Brit. Ent., Haust. i. p. 24 (1827); Doubleday, Gen. Diurn. Lep. i. p. 38 (1847).

"HEAD rather large, very hairy.

"Eyes large, round, prominent.

"*Labial palpi* rather longer than the head, very hairy. Basal joints long, curved at the base, carinate externally, obliquely truncate at the apex; second joint rather more than one third the length of the first, much more slender, ovate, truncate at the base; third joint about one sixth the length of the first, oval.

"*Antennæ* short, terminating in an abrupt, short, compressed club.

"THORAX rather slender.

"*Anterior wings* elongate, rounded externally. The discoidal cell very small, barely one third the length of the wing. Subcostal nervure five-branched; the first nervule thrown off

about the middle of the wing; second about equally distant from the first and third; fourth rather nearer to the third than that is to the second. Upper discocellular nervule very short, barely visible above. Submedian nervure bent near the base.

“*Posterior wings* obovate. The discoidal cell very small. Subcostal nervure branching beyond the middle of the wing. Discoidal nervure thrown off from the subcostal about midway between the bifurcation of the latter and the base of the wing, much bent at the end of the cell. Lower discocellular nervule short. Submedian nervure bent near the base. Precostal nervure branched; the inner branch very short and obscure, the outer rather long.

“*Legs* slender. Paronychia as long as the claws, very slender. Pulvillus very minute, consisting merely of a very small fringed cushion, placed between the claws, quite at the base, only visible below.

“*ABDOMEN* slender, elongate, extending slightly beyond the posterior wings.

“*LARVA* slender, tapering towards each extremity, pubescent.

“*PUPA* elongate, angular, not arched.

“In general the species of this genus frequent open places in woods, flying not very rapidly, with an undulating unsteady motion. Our own species occurs both in the spring and autumn. Those of the autumnal brood, almost entirely wanting the black at the apex, have been formed into a species by Hübner, under the name of *P. erysimi*.

“The larva feeds on various Papilionaceous plants, especially *Vicia cracca* and *Lotus corniculatus*; resembling in this respect those of the genera *Terias*, *Colias*, and *Callidryas*, more than those of *Pieris* and *Anthocharis*. It is green, with a lateral yellow stripe. The pupa is elongate, very pointed at each extremity.” (*Doubleday, l. c.*)

Leucophasia sinapis.

Papilio sinapis, Linnæus, Syst. Nat. i. 2, p. 760 (1767).

Leucophasia sinapis, Lang, Butt. Eur. p. 45, pl. x. fig. 4 (1881); Pryer, Rhop. Nihon. p. 7, pl. ii. figs. 7 & 8 (1886).

Leucophasia amurensis, Ménétrics, Schrenck's Reisen, ii. p. 15, pl. i. figs. 4 & 5 (1859).

Leptosis sinensis, Butler, Cist. Ent. i. p. 173 (1873).

Leucophasia ribilia, Janson, Cist. Ent. ii. p. 272 (1878).

Leptosis morsei, Fenton, Butler, Proc. Zool. Soc. Lond. 1881, p. 855.

“Expands from 1·37–1·68 in. Wings white, fore wings with dusky coloured spots at the tips, of a roundish shape, and darker in the male than in the female. Hind wings white. Underside fore wings white, faintly marked with greenish yellow at the tips; hind wings with dusky shading, and one white and several greenish spots. Head, thorax, and abdomen black; antennæ black, with white flattened clubs.

“*Larva* green, with a darker stripe on the back where the dorsal vessel shows through; beneath this on each side is a yellow stripe. June and September, the insect being double-brooded.

It feeds on *Vicia cracca*, *Lotus*, *Lathyrus*, and several other plants of the order Leguminosæ."
(*Laut.*, l. c.)

"*Chrysalis* yellowish green or grey, rusty red on the sides and on the wing-cases." (*Boisduval*.)

For an extended account of the early stages and figures of larva and pupa see Buckler's 'Larvæ of British Butterflies.'

Var. **amurensis**, Ménétriés. "Alis oblongo-elongatis, albis; maris, anticis margine exteriori sinnatis, apice macula nigra notatis, femine immaculatis; maris subtus alis posterioribus concoloribus, vix striga transversa nebulosa notatis.

"Enverg. 15 lign.

"Cette espèce est très voisine de la *L. sinapis*, mais la coupe de ses ailes la fait facilement reconnaître; elle offre des caractères plus tranchés que ceux de la *L. lathyræ*, Hüb., Duponch.

"Les ailes supérieures sont plus étroites; plus allongées, leur bord antérieur est droit; elles sont arrondies au sommet (ou angle apical), puis faiblement sinuées à leur bord externe, chez le mâle, car chez la femelle ce bord est droit jusqu'à l'angle interne qui est sensible chez les deux sexes, et non arrondi comme chez la *sinapis*. Les ailes inférieures ont leur bord externe moins arrondi; chez les mâles la partie de l'aile la plus longue est plus proche de l'angle externe, tandis que chez la *sinapis* elle se trouve au milieu de l'aile; le bord postérieur est plus droit et non arrondi; chez la femelle tout le bord externe, depuis l'angle externe jusqu'à l'angle interne, forme un oval.

"En dessus les ailes sont blanches; les supérieures présentent une tache noire à leur sommet à peu près comme chez la *sinapis* (cette tache varie de forme), mais quelquefois de teinte brunâtre claire, et qui disparaît entièrement chez la femelle. En dessous, les ailes sont blanches: chez les mâles, les supérieures offrent le long du bord antérieur, depuis la base jusque vers le milieu de ce bord une large bande à teinte jaunâtre fortement saupoudrée de noir, mieux marquée que chez la *sinapis*, mais qui laisse également blanchâtre, le croissant situé à l'extrémité de la cellule discoidale: la tache noire du sommet est représentée par une teinte jaunâtre. Les ailes inférieures présentent quelquefois la trace de la bande transversale inférieure de la *sinapis*. La femelle diffère par ses ailes inférieures faiblement teintées de jaunâtre et saupoudrées d'atomes bruns, plus serrés le long de la 5^e cote ('Pterographie,' Herrich-Schäffer), tandis que l'intervalle entre la 5^e et la 6^e cote ou nervure, forme une bande blanchâtre dépourvue d'atomes et qui se continue à travers la cellule discoidale, à peu près comme chez la *sinapis* mais sans interruption. Le reste comme chez cette espèce.

"D'après 6 individus mâles, et 3 femelles rapportés des rives de l'Amour par MM. Maack et Schrenck. Ce dernier voyageur qui a été fort exact à noter le lieu et l'époque de ses chasses les a pris vers la fin du mois de juillet.

"Cette espèce est répandue, selon M. Schrenck, depuis les montagnes de Bourcia jusqu'à Pakhale, ainsi entre le 48^½ et le 50^½; depuis nous l'avons reçue de Kiachta par M. Popoff."
(*Ménétriés*, l. c.)

Var. **sinensis**, Butler. "Allied to *L. sinapis*, wings longer; fringe tinted with red-brown; primaries more dusky at base, costal margin and apex red-brown; a large subapical oval black spot. Wings below white; fringe as above; primaries with apical half of costa and apex ochreous; discoidal cell, area immediately beyond it, and a large subapical patch greyish green; a white spot on upper discocellular. Expanse of wings 1 inch 10 lines.

"Shanghai (*W. B. Pryor*), B.M." (*Butler, Cist. Ent.*)

Var. **vibilia**, Janson. "Above creamy-white, the body black, dusted with white: primaries with the basal half of the costa and four short ill-defined longitudinal stripes at the apex dusky black: beneath cream-coloured, the posterior part of the primaries white, the costa broadly dusted with black: secondaries strongly dusted black on the anal half and on the costa, leaving a narrow longitudinal stripe of the ground-colour, the dusky-black scales becoming rather sparse on the apical margin, but are very close, and form an obscure transverse band about one third from the apex.

"Expanse of wings $1\frac{1}{2}$ - $1\frac{3}{4}$ inch. Nambu, North Japan.

"Differs from *L. amurensis*, Mén., besides the colour and markings, in having the primaries more acutely pointed at the apex. It is also allied to *L. duponcheli*, Staud." (*Janson, l. c.*)

Var. **morsei**, Fenton. "Allied to *L. amurensis*. Wings rounder, not produced at the apex: the black apical patch lighter: average expanse of *L. amurensis*, ♂ 1 inch $11\frac{1}{2}$ lines, ♀ 2 inches $\frac{1}{3}$ line; of *L. morsei*, ♂ 1 inch 11 lines, ♀ 2 inches." (*Fenton, l. c.*)

"Iburi, Hokkaido, end of July. Colls, Fenton & B.M.

"The example sent to us by Mr. Fenton certainly bears out the distinctions laid down in his above description; and I have little doubt that this is a genuine species." (*Butler, P. Z. S.*)

This very variable species is common all over Japan and Corea. I have received it from the province of Kwei-chow, Western China. All the gradations between typical *sinapis* and var. *amurensis* occur, but, as a rule, all the Eastern-Asian forms are less green and have less marking on the under surface. Specimens without any black on apex of primaries, corresponding with var. *erysimi*, are not unusual.

Morsei is a modification of the typical form; the under surface is whitish, and the black spot at apex of primaries above may be large and conspicuous or only faintly indicated. *Siuensis* is a modification of the long-winged *amurensis* form; the type in the National Collection is without a head, and the apical spot is brown and faded.

In Amurland both *sinapis* and var. *amurensis* are common, and occur together in the same localities. Graeser states that he never met with a specimen which he could consider intermediate between *amurensis* and *sinapis*; Staudinger also considers these insects to be distinct species, but Bremer records intermediate forms from Amurland, and Elwes states that such forms exist both in his own and in Mr. Godman's collections. I also have intermediate forms in my own collection.

Alphéraky records *L. sinapis* from Ché-pon, in the province of Kou-sou, and from the plateau of Amdo. He states that the specimens are larger than those from Turkestan and Thian-shan, but do not differ in other respects.

Distribution. Europe, Western and Central Asia, Siberia, Amurland, Japan, Corea, China, and Thibet.

Leucophasia gigantea. (Plate XXXVI. figs. 10, 11.)

Leucophasia gigantea, Lecch, Entomologist, xviii. p. 45 (1890).

♂. White. Primaries with a large black spot on the second discoidal nervule, sometimes extending upwards to the first; a smaller one on the discocellular. Under surface of primaries with the black spots faintly reproduced. Secondaries have an angulated suffused band indicated by a blackish costal streak, and a curved mark between the discoidal and third median nervules; a short black bar at end of discoidal cell; the venation is dark, especially on the secondaries and outer margin of primaries. Head black; collar yellow; thorax black dusted with white; pectus sprinkled with yellow; abdomen white.

♀. Under surface of secondaries and apex of primaries tinged with yellowish, the black markings more band-like, with the addition of a zigzag black submarginal line; all these markings are faintly seen through from above.

EXpanse. ♂ 48-62 millim., ♀ 72 millim.

The specimens of the May brood are without black spot on primaries, the colour is more creamy, and the venation appears more prominent. I propose the name of *immacula* for this seasonal form (Plate XXXVI. fig. 10).

The type is separated from the other species of *Leucophasia* by the large black spot on primaries, and both forms are distinguished by the yellow collar.

A fine series taken at Chang-yang, Central China, in May and August. I have also received specimens from the province of Kwei-chow, Western China.

Genus SERICINUS.

Sericinus, Westwood, Trans. Ent. Soc. 1851, p. 173; Gen. Diurn. Lep. ii., App. p. 530 (1852).

"*Labial palpi* nearly double the length of the head, nearly horizontally projected, hirsute (not clothed with long bristles).

"*Antennæ* only slightly clavate, about thirty-jointed, gradually thickening.

"*Fore wings* triangularly ovate, rounded at the tip. Postcostal vein four-branched; branches simple: the first and second arising before the extremity of the discoidal cell, the third from its apex, and the fourth in the middle of the space between its apex and the tip of the wing. Upper discocellular vein very short; the middle one much longer, annulated in the middle; lower discocellular shorter, being almost contiguous with the extremity of the median vein.

"*Wing wings* suboval, with the third branch of the median vein produced into a very long and narrow tail; at the base of the wing is a minute pre-discoidal cell.

"Type: *Pap. telamon*, Donovan." (Westwood, G. D. L.)

Sericinus telamon. (Plate XXXIII. figs. 7, 8, var.)

Papilio telamon, Donovan, Ins. China, pl. xxvii. fig. 1 (1798).

Sericinus telamon, Gray, Proc. Zool. Soc. Lond. 1852, p. 71; Cat. Lep. Ins. Brit. Mus.

i. pl. xiii. fig. 4 (1852); Bremer & Grey, Schmett. N. China's, p. 5 (1853);
Ménétriés, Cat. Mus. Petr. Lep. i. p. 70, pl. vi. fig. 3 (1855).

Sericinus fasciatus (♀), Bremer & Grey, l. c.; Ménétriés, l. c. pl. vi. fig. 1.

Sericinus telamon, Gray, Proc. Zool. Soc. Lond. 1852, p. 73; Cat. Lep. Ins. Brit.
Mus. i. p. 78, pl. xiii. fig. 3 (1852).

Sericinus greyi (♀), Bremer & Grey, l. c. p. 6; Ménétriés, l. c. pl. vi. fig. 2.

Sericinus montela, Gray, Proc. Zool. Soc. Lond. 1852, p. 71; Cat. Lep. Ins. Brit. Mus.
i. p. 78, pl. xiii. figs. 1 & 2 (1852).

Sericinus fortunei (♀), Gray, Proc. Zool. Soc. Lond. 1852, p. 72; Cat. Lep. Ins. Brit.
Mus. i. p. 79, pl. xiii. fig. 5 (1852).

Sericinus cressonii, Reakirt, Proc. Ent. Soc. Phil. iii. p. 499 (1861).

Sericinus telamon, var. *koreana*, Fixsen, Rom. sur Léop. iii. p. 257 (1887).

Sericinus telamon, var. *flaxent*, Staudinger, Rom. sur Léop. vi. p. 136 (1892); *greyi*, ♂.
Fixsen, Rom. sur Léop. iii. p. 260, pl. xiii. fig. 1.

"*P.* alis caudatis concoloribus, flavescens, maculis fasciisque nigris, posticis utrinque striga
sanguinea nigro-marginata. Expans. alar. 3 unec.

"The wings coloured alike, pale yellowish, with black spots and bands, the posterior with very
long narrow tails, and a red streak bordered with black at the anal angle. Expansion of the
wings 3 inches." (*Westwood, Donovan's Ins. Chin.*)

"*Male*. The fore wings yellowish white, with the anterior and most of the exterior margins rather
broadly edged with black; an abbreviated line in the middle, another at the anterior part of
the costal area, and then a curved line of irregular spots, which ends towards the posterior
angle, and with two small spots at the anterior angle near the outer margin, also one spot on
the inner margin, black. The hind wings yellowish white, with the anal angle black, which
apparently extends towards the anterior margin by two oblong spots of the same colour:
the anal angle is ornamented by a crimson line that reaches to the third nervure from the inner
margin: there are also three pale blue lunules. The under surface of the fore wings is very
similar to the upper side, except that the black which surrounds the anterior and part of
the exterior margins is not apparent. The under surface of the hind wings is also similar
to the upper side, except that the spot of the anterior margin is ornamented by a crimson
centre." (*Gray, P. Z. S.*)

Femelle (fasciatus, Bremer & Grey). "*Alis supra: nigris, anticis fasciis flavescens; posticis*
maxime caudatis, fasciis tribus flavescens, quarta sanguinea, maculis submarginalibus
caeruleis, lunulisque marginalibus flavescens; subtus: anticis isdem ut supra, posticis
luteis maculis nigris, fascia sanguinea et lunulis tribus caeruleo-pruinosis. Expans. alar.
antic. unec. 3-3½." (*Bremer & Grey, l. c.*)

Var. *montela*, Gray. *Male*. "Like the preceding (*telamon*); but the fore wings have a large
subtriangular black spot very near the base, which is divided into three spots by the nervures.
The anterior margin is slightly edged, and the exterior margin is, for most part, broadly margin-
ed with black. The hind wings have a broad band obliquely across the costal area, and
the crimson band at the anal angle appears broader in this species.

"Always, as Mr. Fortune had kindly informed me, found in the valleys among the hills." (*Gray,*
P. Z. S.)

Female (*fortunei*, Gray). "The fore wings are yellowish white, with many irregular black spots which vary in size, some of them so placed that they apparently form five bands across the wing; the external margin is also black. The hind wings 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 fifth nervure, the third or marginal band is ornamented on the deep black below the crimson by a series of pale blue lunæ. The under surfaces of all the wings are less prominently marked, otherwise they are similar to the upper side, except that on the fore wings there are two crimson spots, one on the band near the costal area, and the other on the posterior margin.

"Found, according to Mr. Fortune, on the sides of the hills." (*Gray, P. Z. S.*)

Var. **ressonii**, Reakirt. "*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 submarginal row of small yellow lunæ.

"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 lunæ; a very large yellow patch on the costal margin near the outer angle; a large lunæ of the same colour, 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.

"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.

"Expanse 3.13 inches." (*Reakirt, l. c.*)

Var. **telmona**, Gray. (Plate XXXIII. fig. 7, ♂.) *Male*. "The fore wings ochraceous, with the base black, and the other black markings placed as in *S. montela*, though not quite so prominent, but the short band which crosses the wing just beyond the costal area and the spot on the posterior margin are both ornamented with a small crimson spot. The hind wings have the inner margin black, and are without the basal spot in the costal area: the crimson band at the anal angle extends, as in *S. fortunei*, to the fifth nervure, and like it also the spot on the anterior margin is ornamented by a crimson mark, which is more equally placed with the commencement of the crimson band that advances to the anal angle than in the other species: the black space at the anal angle is less in size, but is furnished with blue lunæ. The under surface of the fore wings is marked like the upper side. That of the hind wings is also similar to the upper side, but the black spots on the anterior margin are both ornamented with crimson: the lengthened crimson band is marked between the second and third nervures from the anal angle with a white lunæ, and there is also a less quantity of black at the anal angle." (*Gray, P. Z. S.*)

Female (*grayi*, Bremer & Gray). (Plate XXXIII. fig. 8, ♀.) "Alis supra: nigris, fasciis

maculisque luteis; anticis utrinque maculis duabus sanguineis, posticis caudatis, fascia sanguinea; ante caudam maculis caeruleo-pruinosis et lunulis marginalibus luteis; subtus: anticis albido-luteis, fasciis nigris atque fuscis, maculis sanguineis; posticis argenteo-micantibus, maculis fascisque fuscis, fascia submarginali rosea, nigro-marginata, lunulis marginalibus argenteis, margine ultimo externe striga rufa cincto; angulo ani nigro caeruleo-pruinoso. Expans. alar. antic. unc. 2 $\frac{1}{2}$.* (Bremer & Grey, l. c.)

This species seems to be variable wherever it occurs, and although most of the forms have been considered distinct species some of them exhibit only such unimportant differences from the type that they hardly seem to merit even distinctive varietal names. There are two broods in all the localities where it occurs, and the specimens of the first brood differ from those of the second brood in each locality.

True *S. telamon*, as figured by Donovan*, occurs in the neighbourhood of Pekin, N. China, and is chiefly distinguished by the absence of black on the basal area of the primaries and the small amount of black on other portions of these wings. I met with typical examples at Gensan, Corea, in July, and more commonly with other specimens in which the black markings are stronger, and in some of these examples there is a more or less well-defined black basal patch on primaries, whilst in others there is a black subbasal streak on secondaries.

What I consider to be the typical female is also from Pekin and has been described by Bremer and Grey as *S. fasciatus*. I have some examples of this sex from Central China which agree almost exactly with Bremer's figure, but the majority of the specimens from thence agree better with Gray's figure of *S. fortunei*, which is the proper female of *montela*, Gray, a form of *S. telamon* found not uncommonly during the summer at Ichang and Kiu-kiang, Central China. The male of this form is larger than typical *telamon* and the black basal markings are more pronounced on all the wings.

Fixsen says of his var. *koreana* that it is intermediate between Donovan's type and *montela*, Gray, and adds that the female agrees with *fasciatus*, Bremer.

The first generation or spring brood of *S. telamon* is represented in North and Central China by *telmona*, Gray (σ), and *greyi*, Bremer & Grey (φ). Var. *fiarseni*, Staudinger (= *greyi*, Fixsen), is the Korean representative of the

* It should be mentioned that Donovan's figure, afterwards reproduced by Gray, has the head and antennae of some species of *Papilio*, and certainly not those of a *Sericinus*.

spring form, and differs principally from *telmona* in the greater amount of black at base of wing, in having additional black markings on the disc, and in possessing a black interrupted submarginal band.

Graeser (Berl. ent. Zeit. 1888, p. 63) states that he met with both broods, the first being on the wing in April and May, and the second in July, in a clearing in the forest at Poltafka, about 100 versts south of Vladivostock, near the Korean frontier.

According to Dr. Staudinger, the brothers Dörries found the first brood of *S. telamon* in the Sutschan district on the 14th of May, when the specimens were rather worn; larvæ, mostly full-grown, were obtained on the 20th of June, and the second brood was on the wing from the 6th to the 20th of July.

The second generation of larvæ were full-grown by the middle of August. The species was plentiful, but only occurred in one locality where there had formerly been some Chinese huts.

He states that the larva, which feeds on *Aristolochia*, is from 37–39 millim. long, and similar in form to that of a *Thais*. The whole body is covered with warts emitting short thick hairs, and there are conical warts bearing tufts of rather longer hairs on the 2nd, 3rd, and 4th segments. The 1st segment has a long haired projection on each side and retractile horns on the dorsal surface, as in *Papilio machaon*. In colour it is black, with six rows of small round brownish spots on which the warts are placed; the dorsal rows of spots are the largest.

Pupa 18–22 millim. in length; secured by a silken girdle as in *Thais*. Dirty brown streaked with darker; there are two short projections from the anterior end, a row of sharp thorn-like projections along the back, the first two are double; the posterior end is truncate.

The examples of the second or summer brood of *S. telamon*, from Amurland, agree in most characters with the specimens met with in numbers by Herz to the north of Peking. They are, however, rather larger, and the black markings in the male are broader and more numerous. The females especially are darker than Chinese specimens, and some of them are so dark that they might be described as black with small partly obscured yellow transverse markings. The largest male measures 67 millim. and the largest female 64 millim. in expanse; whilst the smallest example of each sex expands only 56 and 54 millim. respectively, but the male average expansion is over 60 millim.

Dr. Staudinger has named the form to which the above remarks refer var.

armurensis, and another, which appears to be the Amurland spring form, he has called var. *telemachus*.

I received specimens from Kwei-chow, but from no other locality in Western China.

Distribution. Amurland, North, West, and Central China, Corea.

Genus ARMANDIA.

Armandia, Blanchard, Compt. Rend. Ixxii. p. 809, note (1871).

Bhutanitis, Atkinson, Proc. Zool. Soc. Lond. 1873, p. 570.

“*Head* of medium size, hairy. Labial palpi very hairy, long, slender, obliquely porrect, extending far beyond the eyes. Antenne short, slender, with an elongated curved club.

“*Thorax* rather slight. Anterior wings elongate, elliptical; first subcostal nervule originating at nearly three fourths the length of the cell, the second about halfway between the origin of the first and the end of the cell, the third considerably beyond the cell, and the fourth somewhat nearer to the origin of the third; upper discocellular nervule very short, middle discocellular longer than the upper and lower together, basi-median nervule wanting. Posterior wings elongate, the basal half very narrow, inner margin concave beyond the extremity of the abdomen, outer margin prominently convex, scalloped, and tailed; the precostal nervule branched, nearly as in *Eurycus*. Legs of moderate length; anterior tibiae with a stout spine near the middle; tarsi slender, the first joint very long; claws simple, of unequal length.

“*Abdomen* slender, extending to less than half the length of the posterior wings.” (*Atkinson, l. c.*)

Armandia thaidina.

Armandia thaidina, Blanchard, Compt. Rend. Ixxii. p. 809, note (1871).

Armandia thaidina, Oberthür, Étud. d'Entom. iv. p. 18, pl. i. fig. 1 (1876), xi. p. 14 (1886).

“Corps frêle comme chez les *Thais*, port de nos *Papilio*, ailes plus délicates, antennes aussi longues à massue mince, palpes aussi saillants que ceux des *Thais* et presque semblables par la forme. Taille de nos *Papilio pualivius* et *machaon*: les ailes d'un noir mat; les antérieures traversées par huit raies jaunes, dont la troisième, la cinquième et la huitième incomplètes, les ailes postérieures également traversées par des raies jaunes et ornées d'une bande rouge dentelée, n'atteignant que le bord antérieur, plus en arrière, de trois taches bleues un peu éteintes et enfin de trois petites raies fauves; un grand prolongement médian en forme de queue et deux dents internes de longueur inégale; le corps noir avec des poils jaunâtres sur le côté du thorax et de l'abdomen. La femelle semblable au mâle.” (*Blanchard, l. c.*)

Male. Primaries black, traversed by seven yellow lines, the third and fifth from the base only extend from costa to median nerve, the others are confined to inner margin. Secondaries black, with one entire and three interrupted yellow lines from costa to median nerve, which together with its branches and the submedian nervure are also yellow; a fairly broad crimson band, sinuate on its outer edge, extends from the discoidal interspace to the abdominal margin and is followed by three dark blue spots with paler centres; there are five yellow linear spots on the outer margin, the lower ones tinged with reddish. The tail is long,

gradually increases in width to its rounded apex, and between it and the anal angle there are two shorter tails. Fringes yellowish.

Female. Similar to the male, but the outer margin of primaries is rounder in contour, and all the yellow lines are duller in colour. The crimson band on secondaries is often replaced by a pale pinkish one.

Expanse, ♂ 94-100 millim., ♀ 98-106 millim.

Appears to be fairly common in June and July at Huang-mu-chang, Chia-kou-ho, Ta-chien-lu, Wa-ssu-kow, and Wa-shan in Western China.

A. thaidina is best distinguished from the Himalayan *A. lidderdalii*, Atkinson, by its smaller size and the greater breadth of the tails; the lines traversing the central area of primaries are straighter, and the crimson band on secondaries is narrower.

Genus LUEHDORFIA.

Luehdorfia, Crüger, Verh. Ver. Hamb. iii. p. 128 (1878); Schatz & Rober, Exot. Schmett. p. 50, pl. iii. (1892).

“Die Palpen sind kürzer als bei *Thois*, aber länger wie bei *Doritis*, nicht über den Kopf hervorragend, 3-gliedrig, mit steifen Haaren besetzt. Fühler schwach gebogen, mit allmählich verdickter Kolbe; Vorderrand der Vorderflügel ausgeschweift; Subcostalader 5-ästig, mit 2 Ästen vor dem Zellende; O. D. C. klein, aber deutlich vorhanden.

“Hinterflügel mit einfacher nach innen gebogener Präcostalader und deutlicher Präcostalzelle.

“Füße mit stark verdickten Schenkeln; Klauen einfach, fast gerade.

“♂ Analklappen mit dichtem, braunem Filze bekleidet.”

Luehdorfia japonica. (Plate XXXIII. figs. 2 ♀, 1 var. ♀.)

Luehdorfia japonica, Lecch, Entomologist, xxii. p. 25, pl. i. fig. 1 (1889).

Luehdorfia puziloi, Pryer, Rhop. Nihon. p. 5, pl. i. fig. 10 (1886).

Expanse 70 millim. Primaries pale yellow, black at base and external margin, with three transverse oblique black bands on the disc, and one parallel with outer margin, with which the third oblique band is united below the middle; a black dash from the costa between first and second and second and third oblique bands. Secondaries pale yellow, with a broad black band along the inner margin, and another, oblique and interrupted, on the disc, beyond which is a black costal dash; the outer third black, enclosing five blue spots, and edged externally with some orange patches; a conspicuous crimson blotch above anal angle. Fringes chequered black and white. Under surface as above, but the crimson colour assumes a band-like form, traversing the wing parallel with the outer margin from anal angle to second subcostal nervule; the orange on outer margin also forms a complete band.

This species was erroneously referred to as *L. puziloi* by Mr. Pryer in his catalogue of the ‘Lepidoptera of Japan,’ and subsequently by myself in my paper on the ‘Lepidoptera of Japan and Corea,’ P. Z. S. 1887, when I did not

possess specimens of the species. I at first considered it to be merely a local form of *L. puziloi*, but the following characters are amply sufficient to separate it from that species. In the first place the "pouch" of female of *L. japonica* is without a keel, and is black instead of light chestnut; this, without reference to other points of difference, at once distinguishes it; but, further, it is much larger in size, the ground-colour is darker, and the anal blotch is broader and of a bright crimson.

Found in Japan in mountain districts. Mr. Pryer (Ent. Mo. Mag. xxiv. p. 66) says:—"This insect appears very early in the year; my first specimens were obtained on the 15th of April, but it was then getting over; the males appear before the females, and it frequents wooded paths on the mountains, and is very easy to capture."

I have received a form of this species from Central China, where specimens were taken by a native collector in the mountains in the neighbourhood of Chang-yang. These differ from Japanese specimens in being smaller; the secondaries agree better with the Amurland *L. puziloi**, but the red colour which forms a subanal patch on the secondaries of both *puziloi* and *japonica* is continued in this Chinese form as a submarginal band as far as the discoidal nervure; the body is more slender and less hairy than in *japonica*; the hairs are reddish brown instead of whitish, and the pouch of the female only differs in its smaller size. This form may be known as var. *chinesis* (Plate XXXIII. fig. 1).

Genus PARNASSIUS.

Parnassius, Latreille, Hist. Nat. des Crust. et Ins. xiv. p. 110 (1805); Doubleday, Gen. Diurn. Lep. i. p. 26 (1847).

"HEAD small, very hairy.

"Eyes oval, not prominent.

"Maxilla of moderate length.

"Labial palpi distinctly triarticulate; the joints nearly equal, the basal one curved.

"Antennae short, gradually clavate, not arched.

"THORAX rather stout, very hairy.

"Anterior wings subtriangular, rounded externally, diaphanous. Subcostal nervure terminating

* *L. puziloi*, Erschoff, occurs commonly in Southern Amurland. Referring to this species, Graeser (Berl. ent. Zeit. 1888, p. 63) states that the larva is black, covered with a few stiff black hairs, and having the segmental divisions bluish white. Feeds on *Asarum* until July. He adds that he found it commonly under stones in the vicinity of the food-plant.

in only four nervules; of which one is thrown off beyond the middle of the cell, the second a little before its end, the third about halfway between the cell and the apex of the wing. Upper discocellular and baseo-median nervules both wanting.

- “ *Posterior wings* elongate, ovate, emarginate internally, without any abdominal folds, subdiphanos. Precoastal nervure not branched.
- “ *LEGS* short. Anterior tibiæ with a short flat spur. Tarsi longer than the tibiæ; basal joints about equal to the rest combined; second, third, and fourth progressively shorter; fifth longer than the second. Claws simple; inner very sharp, long, grooved internally; outer about two thirds the length of the inner; the points directed inward; base of the claws with a horny projection.
- “ *ABDOMEN* short, stout, very hairy, terminated in the females by a corneous peuch or plate.
- “ *LARVA* cylindric, slightly tuberculate.
- “ *PUPEA* cylindrico-conic, subfoliulate.

“ This genus may be known from all other Papilionidæ by the structure of the anterior wings, in which one subcoastal nervule, apparently the first, is wanting. This character and its more distinctly triarticulate palpi separate it from *Doritis* on the one hand, and *Euryeus* on the other.

“ There is a striking resemblance in the markings of the anterior wings in this genus and in *Euryeus*, more especially in the round black spots in the middle of, and at the end of, the cell. In fact *Euryeus* may be viewed as the Australian representative of *Parnassius*.

“ The larvæ, as far as is known, feed on sedums, saxifrages, and fumitories; they are pubescent, velvety black, with numerous orange spots and small tubercles.

“ The pupæ are enclosed in a loose silken web, supported also by some transverse threads: they are subcylindric, conic posteriorly, not angular, and, from being covered with bluish powder, very much resemble those of the genus *Catocala* amongst moths.” (*Doubleday, l. c.*)

Parnassius epaphus.

Parnassius jacquemontii, Blanchard, Jacquem. Voy. Ind. iv. pl. i. fig. 3 (1844); Gray, Cat. Lep. Ins. B.M. i. pl. xii. figs. 1, 2 (1852).

Parnassius jacquemonti, ♀, Boisd.; Elwes, Proc. Zool. Soc. Lond. 1886, p. 36.

Parnassius epaphus, Oberthür, Etud. d'Entom. iv. p. 23 (1879), xiv. p. 9, pl. i. figs. 4 ♂, 5 ♀ (1891).

Parnassius epaphus, var. *caclémiriensis*, Oberthür, op. cit. xiv. pl. i. figs. 6 ♂, 7 ♀.

Parnassius epaphus, var. *sikkimensis*, Elwes, Proc. Zool. Soc. Lond. 1882, p. 399, pl. xxv. figs. 4, 5, ♀.

Parnassius pocta, Oberthür, Etud. d'Entom. xvi. p. 2, pl. ii. fig. 9 (1892).

Male. Creamy white. Primaries are blackish at the base and narrowly along the costa; a black or oblong spot in the discoidal cell, a curved one at end of the cell, and two, frequently united and sometimes with red centres, beyond the end of the cell; submarginal band composed of black lunules; marginal band greyish black; a black spot about the middle of the submedian interspace. Secondaries have three red spots encircled with black, the first is at the base, the second just below middle of the costa, and the third rather beyond the centre of the wing; the abdominal third of the wing is black, its outer edge deeply indented; submarginal band composed of black lunules. Wings of the ground-colour, chequered with black at the extremities of the nervules, where they are preceded by linear spots on the primaries, and roundish ones on the secondaries. Under surface of primaries rather glossy; all the spots as above, but, with the exception of those of discoidal cell, obscured; secondaries have the base blackish and four whitish-centred red spots forming a subbasal band, outwardly edged with black; there is a pale red spot near costa outlined in black, a similar one beyond the centre of the wing, and two others above anal angle (some specimens have a smaller pale red spot between the anal pair and that beyond centre of the wing); submarginal band composed of black lunules; fringes and spots on margins as above.

Female. Similar to the male, but the wings are sometimes slightly powdered with black; submarginal lunules are edged internally with greyish black, and the greyish-black marginal band is broader.

The foregoing description is made from specimens in my collection which agree in all important characters with Oberthür's figure of *P. epaphus*, also with *P. jacquemonti*, Gray, and Blanchard's *jacquemonti*, fig. 3.

Var. *poeta*, Oberthür. "*Poeta* est beaucoup plus obscur; les parties noires sont plus étendues et les ailes supérieures, à part les parties blanches de l'espace cellulaire, sont, dans certains exemplaires, presque entièrement couvertes par un semis d'atomes noirs. Le fond des ailes dans *poeta* est un peu jaunâtre comme chez *mercurius*. *Epaphus-cacheuiriensis* autre forme, sans doute issue de la même souche originelle, reste généralement d'un blanc assez pur et assez éclatant.

" Dans *poeta*, les antennes sont, comme chez *epaphus*, annelées de blanc avec la massue noire; le corps est très velu; les poils sont blanchâtres, très longs et recouvrent la base des ailes et le bord anal des inférieures; les taches rouges sont généralement très développées, mais variant comme nombre de 1 à 3 aux ailes supérieures. La tache rouge près du bord costal persiste dans tous les exemplaires que j'ai sous les yeux.

" Aux ailes inférieures, la tache rouge basilaire existe parfois comme chez *epaphus* type ou est absente comme chez *epaphus-cacheuiriensis*. La frange est très entrecoupée de blanc et de noir; mais, aux ailes inférieures, il y a tendance à ce que le noir marginal soit rétréci et à ce que la frange soit blanche sauf un point de contact de la nervure.

" La tache rouge médiane de l'aile inférieure est quelquefois papillée de blanc. Thibet." (Oberthür, *Etud.* xvi.)

Mr. Pratt met with a single example of this species at a great elevation in the neighbourhood of Ta-chien-hu, and I received a long series of specimens which were taken by a native collector on the high plateau near the Thibetan

frontier. All these specimens differ from Himalayan examples in being clouded with dusky scales, the red markings are usually brighter and larger, and the females have a very glossy appearance. Oberthür states that his male and female types were taken by Major Charlton in Chinese Tartary together with the types of *jacquemonti*, Gray.

Under the name *cachemiricusis*, Oberthür describes and figures two specimens of *P. epaphus* which he received from a London dealer (these were probably some of my duplicates from N.W. Himalayas). He states that they differ from typical *epaphus* in the absence of the red basal spot on the upper surface of secondaries and in having small red spots, inclining to yellowish, on these wings.

Epaphus is an exceedingly variable species, and I have specimens of both sexes in which there are no traces of red spots on upper surface of any of the wings; other specimens have three well-defined red spots on each wing and all the gradations between these two extreme forms are represented. The central red spots are sometimes connected by a black streak, and in some examples all the spots are pure yellow instead of red, a character not infrequent in other species of the genus. The dark markings vary in size and definition and the fringes are invariably chequered. In expanse of wings the specimens range from 52-72 millim., but the largest example of *epaphus* is smaller than Boisduval's type of *P. jacquemonti*.

Var. *sikkimensis*, Elwes, from Sikkim, is distinguished chiefly by its smaller size.

The species being so variable I found it necessary to retain a series of 118 specimens of those collected by myself in Baltistan and Kashmir in 1887, and by Mr. McArthur in Ladak and neighbouring districts in 1889. So far as my experience is concerned I found that the insect was not often met with below 14,000 feet and its range extended up to 18,000 feet. It frequents grassy mountain-slopes and its flight is not very rapid.

I have received specimens from the Kuktie, Barra-lacha, and Kardong Passes, Depsang, Chonging Valley, and the Karakoram, and from Rudok in Western Thibet.

Poeta is only a slight local form of *P. epaphus*. The male is somewhat more suffused with darker scales and the female is darker and more transparent than the same sex of *P. epaphus*, and usually the red spots are better developed.

Although he was unacquainted with the female of his *poeta*, M. Oberthür expressed himself as certain that it was a local form of *actius*, closely approaching the insect from Amdo and the Siniu mountains, which M. Grun-Grshimailo described in the same year as *P. mercurius**. This was an unfortunate error which he would have avoided if he had had an opportunity of examining the pouch of the female *poeta*, which is without keel and agrees in every respect with that of female *P. epaphus* from the N.W. Himalayas, whereas *mercurius*, of which I have specimens from Amdo, kindly sent to me by M. Grun-Grshimailo, has a keeled pouch exactly as in *actius*.

Parnassius jacquemonti. (Plate XXXIII. fig. 3, var. ♂.)

Parnassius jacquemontii, Boisduval, Sp. Gén. i. p. 400 (1836); Blanchard, Jacquem.

Voy. Inde, iv., Ins. p. 16, pl. i. fig. 4 (1844); Oberthür, Etud. d'Entom. xiv. pl. ii. fig. 11 ♂ (1891).

Doritis actius, Eversmann, Bull. Mosc. 1813, pl. ix. figs. 2 a, b.

Parnassius actius, Lang, Butt. Eur. p. 23 (1884).

Parnassius actius, var. *himalayensis*, Elwes, Proc. Zool. Soc. Loud. 1886, p. 30.

Parnassius jacquemontii, var. *himalayensis*, Oberthür, Etud. d'Entom. xiv. p. 17, pl. ii. figs. 12 ♂, 13 ♀ (1891).

Parnassius tibetanus, Lecch, MS.; Rühl, Palaearktischen Grossschmetterlinge, pt. i. p. 89 (1892).

“Taille de *phobus*. Ailes fortement saupoudrées de noirâtre dans les deux sexes, transparentes à l'extrémité, avec la frange entièrement blanche; la partie transparente précédée, sur les quatre ailes, d'une rangée de lunules noires: les deux taches situées entre la cellule discoïdale des supérieures et cette série de lunules marquées de rouge, ainsi que celle du bord interne. Ailes inférieures ayant le bord abdominal très légèrement évidé, comme dans *apollo*, et fortement noirâtre, une tache rouge à la base; les deux taches rouges ordinaires presque cordiformes, assez grandes, largement pupillées de blanc; celle du disque s'alignant avec trois taches noires, dont l'anale est marquée de rouge. Dessous comme dans les espèces voisines; les taches rouges de la base des secondes ailes plus arrondies en dehors; trois taches rouges s'alignant vers l'angle anal avec celle du disque; antennes noires légèrement annelées de grisâtre.

“Femelle semblable au mâle. La poche de l'extrémité de l'abdomen assez développée plissée en travers et sans carène longitudinale.” (*Boisduval, l. c.*)

Two ♂ and 2 ♀ from the Himalayas taken by Jacquemont.

“Alis albis nigro irroratissimis, apice pellucido, maculis nigris rubro tessellatis; antennis cinereis, nigro annulatis.

“Envergure 60 à 70 millim.

“Ce Parnassien, dont les ailes blanchâtres sont plus fortement saupoudrées de noir que dans toutes

* Horae Soc. Ent. Ross. 1891, p. 445.

les autres espèces du même genre, paraît intermédiaire entre les *P. apollo* et *phaeas*. A leur extrémité, les quatre ailes sont subdiaphanes, cette partie transparente étant précédée d'une série de lunules bordées de blanc extérieurement. Entre cette rangée de lunules et la cellule discoïdale, ces ailes antérieures offrent deux taches noires, ordinairement marquées de rouge, ainsi qu'une autre tache située au bord interne. Comme dans les *P. phaeas* et *apollo*, il existe encore une tache noire à l'extrémité de la cellule discoïdale, et une autre vers son milieu.

- .. Les ailes postérieures ont leur gouttière abdominale très noire, et présentent deux taches ocellées rouges, bordées de noir, et ordinairement blanches au centre : l'une située au bord externe, l'autre vers le milieu. On remarque en outre à l'angle anal une tache noire allongée souvent marquée de rouge. Les quatre ailes sont en dessous à peu près semblables au dessus : seulement les postérieures offrent à leur bord, comme dans la plupart des Parnassiens, trois ou quatre taches rouges, dont on retrouve à peine la trace en dessus ; ensuite, vers l'angle anal, il existe deux taches rouges très distinctes, dont l'une arrondie et l'autre presque triangulaire. Les antennes sont grisâtres, fortement annelées de noir." (*Blanchard, l. c.*)

The following descriptions refer to the Chinese form (Plate XXXIII. fig. 3. ♂):—

Male. Similar to *P. jacquemonti*, var. *himalayensis*, Elwes, but the ground-colour is very much darker and the wings are less densely covered with scales and are more glossy in appearance, the submarginal band is composed of white bar-like spots bordered with blackish, in *himalayensis* this band is formed of lunulate spots; the central ocellus of secondaries is internally bordered by a pale bar; the crimson spots are of a deeper colour, but that at anal angle is absent. Fringes as in *himalayensis*, but much more broadly chequered with black.

Female. Agrees with the male, but is usually somewhat larger and yellower in tint. The pouch (represented under figure of the male, Plate XXXIII.) agrees in shape with that of *himalayensis*, and varies in colour from dark brown to black.

Expanse, ♂ 69–80 millim., ♀ 78–90 millim.

Appears to be common in Western China at How-kow on the Thibetan frontier, where it occurs at a great elevation.

Fritz Rühl, who describes this insect under my manuscript name *thibetanus*, or, as he writes it, *tibetanus*, states that it occurs at Ta-chien-lu; but this is certainly an error, as this form has so far only been received from How-kow, from whence I had a large number of specimens. It is, without doubt, nothing but a well-marked local race of *P. jacquemonti* and is the darkest form of *Parnassius* known to me. The red spots vary in size and may be with or without white centres; some examples have three red spots on primaries, and in others there are no red spots on these wings. The female varies in colour from yellow to white according to the freshness of the specimens.

The four specimens from the Himalayas (2 ♂, 2 ♀) to which Boisduval refers

are probably the same as those which Blanchard* subsequently described; but, be this as it may, the latter author's description of the male agrees exactly with that of Boisduval. Both authors state that all the wings are thickly powdered with black, and this character at once indicates the species *jacquemonti* and separates it from *epaphus*.

P. jacquemonti is larger and more transparent than *P. epaphus*, and the clear space before the outer margin is broader; the fringes are usually marked with black at the extremities of the nervules, whilst in *P. epaphus* the fringes are always distinctly chequered black and white; the red ocelli on secondaries are almost always pupilled with white, but among hundreds of *P. epaphus* that I have received from the N.W. Himalayas I can only find indications of white pupils in the ocelli of two specimens, both females; there is usually a red mark at anal angle in *P. jacquemonti*, but only one female of *P. epaphus* exhibits any trace of this character. Finally the body of *P. jacquemonti* is more densely clothed with hair than is that of *P. epaphus*, especially on the underside.

Variation in colour and marking is considerable within certain limits. Many specimens have no red markings whatever on the primaries. In a series of over 40 specimens, which I have selected for my own collection, no two examples are exactly alike. The character of the fringes is in this, as in many other species of the genus, unstable and subject to modification. Among the examples there is one specimen from Kokser which has entirely white fringes on both the upper and under sides, whilst in others, taken at the same time and place, the fringes are more or less chequered. In several male specimens from the Dugi Pass the fringes are almost entirely black. In *P. epaphus*, on the other hand, the fringes are constant, and the deep black and white chequers are distinct in all the specimens.

Elwes (*l. c.*) states that Boisduval probably had the sexes of two different species under his observation when he drew up the description of *P. jacquemonti*. I think there is little doubt that this was really the case. M. Oberthür has the type of the male in his possession and has figured it in the 14th livraison of his "Études"; there is, therefore, not the least difficulty in identifying this sex of *P. jacquemonti*. The type of the female is, however,

* The specimen which Blanchard figures (pl. i. fig. 3) is evidently not the one he describes, but it is probably the specimen he mentions as a variety of *P. jacquemonti* without red spots on primaries. It is certainly referable to *P. epaphus*.

lost, and the description of this sex given by Boisduval does not agree with what is now known to be the true female of the male to which Boisduval's description applies. Mr. Elwes, in his paper "On the Genus *Parassius*"*, suggests that the name *jacquemonti* should apply to the female which Boisduval described, because its identity appears to him to be more certainly fixed than is that of the male insect. I quite agree, however, with M. Oberthür that Boisduval's name should apply to the male which we know, and not to the female of which we have no knowledge. In the description of the supposed female of his *jacquemonti* Boisduval says "La poche de l'extrémité de l'abdomen assez développée, plissée en travers et sans carène longitudinale," whereas the true female of Boisduval's *jacquemonti* has a pouch with a well-formed keel.

Var. *himalayensis* occurs in Chamba, Spiti, Lahoul, and Upper Gurwhal. It seems to be very local, but common where it occurs. The type was from Lahoul, from whence I have also received specimens, as well as from Kokser and the Dugi Pass. The examples from the latter locality are very dark and approach the var. *tibetanus*.

P. epaphus also occurs on the Dugi Pass, but at higher elevations than *P. jacquemonti*.

Actius and other forms of *P. jacquemonti* have been described as distinct species, but as these do not belong to the region under consideration it is unnecessary to discuss them here.

Distribution. Central Asia, N.W. Himalayas, Western China.

Parnassius nomion.

Parnassius nomion, Fischer, Ent. Russ. ii. p. 242, pl. vi. figs. 3, 4 (1823); Boisduval, Sp. Gén. i. p. 397, pl. vi. fig. 1 (1836); Lang, Butt. Eur. p. 22 (1884).

Parnassius davidis, Oberthür, Etud. d'Entom. iv. pp. 23, 108, pl. ii. fig. 2 (1879), xiv. p. 2, pl. i. figs. 3, 3 a (1891).

Parnassius nomion, var. *mandschurie*, Oberthür, Etud. d'Entom. xiv. p. 2, pl. ii. fig. 10 (1891).

"Expands 3 in. Very close to *P. apollo*, but the hind wings have a red spot at the base, and the inner margins are more strongly black; all the wings have a hind marginal border of square black and white spots. Time of appearance, July (*Boisl.*) Habitat, Siberia." (*Lang, l. c.*)

Var. *davidis*, Oberthür. "Ressemble beaucoup à *nomion*; mais bien plus obscur, et ayant la bande submarginale blanche des supérieures plus près du bord extérieur que dans *nomion*."

* Proc. Zool. Soc. Lond. 1886, p. 36.

De plus, la frange des 4 ailes est entièrement noire. C'est la seule espèce de *Parnassius* offrant, à ma connaissance, cette particularité.

“ Nord de la Chine (Armand David); 1 ♂. ” (*Oberthür, l. c.*)

Var. *mandschuriæ*, Oberthür. “ J'ai fait figurer la forme de Mantschourie que m'a envoyée M. Jankowski en six mâles et quatre femelles. Le faciès de cette forme géographique est assez particulier et cela tient surtout à ce que le fond des ailes est moins blanc dans les échantillons de Sidemi que dans ceux de Sibérie et du nord de la Chine, ou M. l'abbé David a trouvé une race superbe et magnifiquement colorée de *nomion*. Le feston hyalin qui longe le bord marginal des ailes est aussi généralement plus sombre et avec une apparence huileuse dans les exemplaires de Sidemi.

“ La femelle qui existait dans la collection Boisduval avec cette étiquette que je transcris textuellement ‘ *Nomion*, Fischer, Eschscholtz, Calif. russe ’ est semblable aux femelles de Mantschourie.

“ Dans les six mâles de Sidemi, les ailes supérieures ont tous les points noirs absolument dépourvus de pupillation rouge et une des femelles est ainsi. Les mâles paraissent tendre à avoir les ocelles rouges des ailes inférieures dépourvus de ponctuation centrale blanche ou au moins très peu fortement ponctués de blanc. ” (*Oberthür, l. c.*)

Referring to *P. nomion*, in his paper on the genus *Parnassius**, Mr. Elwes says:—

“ This species, though at first sight very like *P. apollo*, may be certainly and constantly distinguished by the fringes of the wings, which are conspicuously chequered black and white; whilst in *P. apollo* this is never the case to the same extent, though some specimens have a tendency to it. The pouch also (though of the same general form) is black, more lengthened behind, and set on at the end, and not underneath the abdomen; the antennæ, the clothing of the body, and the general pattern of the markings are very similar.

“ I am not aware that the geographical range of the two species anywhere meets, *P. nomion* first appearing in the mountains of Dahuria, whilst *P. apollo* seems to go no farther east than the Altai Mountains; but these ranges on the Siberian frontier are but little known.

“ *P. nomion* appears to be common in the valley of the Amur, at Raddefskaia and Khabarofka, and Christoph found the larva feeding on a yellow-flowered *Sedum* near Vladivostock. According to Ménétriés *P. nomion* is found near Irkutsk and at Kiachta, and I have seen a specimen from this locality in Dr. Fixen's collection.

“ Bremer says it is found on the north side of Lake Baikal on the Onon

* Ibid. 1886, p. 27.

river, and on the Ussuri between Noor and the Ema; the largest and finest specimens are from the Bureija Mountains, and farther west they become smaller."

Graeser (Berl. ent. Zeit. 1888, p. 64) states that the larva is velvety black, covered with yellowish hairs, so thick on the sides as to give it a brownish appearance; there are four triangular red spots on each segment; the spiracles are ringed with red; head round and blackish in colour, frontal line shining pale brown; legs shining black, claspers reddish yellow. Feeds in June on *Sedum*, and the perfect insect appears from the middle of July to middle of August.

The specimen described by Oberthür as *dauidis* was taken by l'Abbé David, in June 1864, among the mountains of moderate elevation which surround the valley of Lao-hou-hou, not far from Jéhol, four days' journey to the north of Pekin. The figure of this insect in my copy of part iv. of Oberthür's 'Etudes' has the fringes entirely black, whilst the antennæ are pale, ringed with black and terminating in a black club; and the black bar at anal angle contains two well-defined red spots. In part xiv. of Oberthür's work the same specimen is again figured (pl. i. fig. 3), and here the antennæ are represented entirely black, the black bar at anal angle is without red spots, and above all the black fringes, to which M. Oberthür attaches so much importance, are distinctly interrupted with white between the nervules on both surfaces of all the wings. Great exactness is claimed for this figure by M. Oberthür, but, curiously enough, it does not agree with the extended description of *dauidis* which he gives on p. 3 of the part last mentioned, and which runs as follows:—

"La figure du *P. dauidis* est donc très exacte et elle fait ressortir les caractères de cette espèce.

"Les antennes sont blanches, finement annelées de noir avec la massue épaisse et noire. Les poils de la tête et du thorax sont jaunâtres mêlés de noir. Les ailes sont généralement obscures avec la frange paraissant entièrement noire. Les dessins et taches sont dans leur ensemble ceux de *nomion* et d'ailleurs de presque tous les *Parassius*. Mais il convient de remarquer que la série marginale des taches blanc-jaunâtre opaques aux ailes supérieures et inférieures est très rapprochée du bord terminal. La poche cornée consiste en une cavité paraissant bilobée vue de face. Le profil est représenté sur la planche I. fig. 3a."

Oberthür says that he would be inclined to consider *dauidis* a local form of *P. honrathi*, if it were not for the fact that the antennæ, which in *dauidis* are white with a black club and finely ringed with black, are entirely black in *P. honrathi*. I cannot agree with him for the following reasons:—The pouch

of *dauidis* as figured by Oberthür agrees better with that of *P. nomion*. The dark abdominal border of secondaries agrees exactly with that of *P. nomion*, and is quite different to that of *P. hourathi*. Moreover, Oberthür informs me in reply to my inquiry on the point that the legs and hairs of the under surface of the body of *dauidis* are not black as they are in *P. hourathi*. The range, too, of *hourathi* appears to be extremely restricted, being confined to a limited district south-east of Samarkand; *nomion*, on the other hand, is distributed throughout the greater part of North-east Asia. I am inclined, therefore, to consider *dauidis* as a form of *P. nomion*.

Grum-Grshimailo described a small bright form of *P. nomion* from Kokonoor and the Dshachar Mountains as var. *nomius* *.

My collectors failed to meet with *P. nomion* in any part of China that they visited.

Parnassius széchenyi.

Parnassius széchenyi, Frivaldszky, Term. Füz. x. p. 39, pl. iv. figs. 1, 1a (1886); Oberthür, Etud. d'Entom. xvi. p. 4, pl. ii. figs. 11 ♂, 13 ♀ (1892).

"Alis anticis cretaceo-albis, eodem colore ciliatis, basi, disco et ad marginem costalem nigro-sparsis; macula cellulari quadrata et disco-cellulari paulo minore tertiaque interna transversa nigris; fascia lata, curvata pone cellulam discoidalem, a ramo subcostali secundo usque ad ramum discoidalem secundum extensa, alteraque subterminali angusta, flexuosa, in ramo subcostali secundo incipiente et usque ad cellulam internam se extendente, a medio vero in maculas parvas dissoluta, nigro-atomatis; limbo terminali lato subtiliterque nigricanti-atomato, venis flavicantibus. Alis posticis paulo saturatius cretaceo-albis, limbo interno lato, extus biangulato, intensive nigro pilisque longis, canis vestito; maculis duabus ocellaribus aurantiacis nigro-cinctis, una infra venam costalem rhomboidali, altera vero majore, rotundata, inter ramum subcostalem secundum et medianum tertium sitis; fascia submarginali angusta, flexuosa, antice dilutiore et ad ramum subcostalem secundum subinterrupta, hinc vero saturate nigra et angulum posticum versus maculis duabus ocellaribus nigris, obscure cœruleo-pupillatis terminata.

"Alis subtus dilutiorebus, levigatis; anticarum signaturis superioribus similibus, sed macula cellulari et discocellulari paulo minoribus, reliquis vero multo obsoletioribus; posticis basi nigro-atomatis, macula parva basali submarginali, lunulis duabus prope basin, maculis ocellaribus, limbi interni vitta et juxta hanc lunulis parvis, fasciæ tenui submarginali nigris, illis omnibus intus tenuiter aurantiaco-cinctis et maculis ocellaribus colorem dilute roseum simulantibus. Caput deest; thorax et abdomen pilis longis canis vestita.

"In Tibet ad lacum Kuku-noor detectus." (*Frivaldszky, l. c.*)

"Ce *Parnassius*, comme *orleans*, habite aux environs de Ta-Tsien-Lou et d'Amdo. Je ne pense pas qu'il ait été retrouvé depuis le voyage au Thibet du hongrois Szecheny, jusqu'à l'été de

* Horæ Soc. Ent. Ross. 1891, p. 445.

- 1891, époque à laquelle M. Groum-Grgimaïlo [Grum-Grshimailo] d'un côté, et S. G. Mgr. Biet d'autre part ont pu en obtenir des échantillons.
- “ Comme l'espèce n'a point encore été figurée, je comble la lacune, et désormais la connaissance exacte d'un magnifique *Parnassius* est assurée.
- “ La femelle figurée est de Tâ-Tsien-Loû. Elle est beaucoup plus chargée d'atomes noirs que la forme d'Amdo. Le mâle est d'Amdo. J'en suis redevable à l'obligeance de M. Groum.
- “ Le *Parnassius szechengi* est une espèce tout à fait à part dans le genre. Elle est très caractérisée par la ligne de taches noirâtres submarginales descendant en escalier du bord costal au bord interne et extérieurement soulignées d'une ombre noire plus foncée.
- “ Les ailes inférieures offrent 4 belles taches bleu ardoise centralement pupillées très finement de blanc, formant ensemble une sorte de bande submarginale à peu près interrompue et finissant en une ombre grise soulignée de noirâtre au voisinage du bord costal.
- “ Le dessous est très particulier avec un ton jaunâtre, transparent, d'un aspect huileux sur lequel ressort en blanc, rose pâle, finement liséré rouge et noir mat, une partie des taches ordinaires.
- “ La poche cornée de la femelle a une forme analogue à celle d'*orleans*; mais elle est plus développée et de couleur plus blanche.
- “ Les pattes sont jaunâtres.
- “ Les antennes gris jaunâtre à la base ont la massue noire.
- “ La femelle est peu velue; mais le corps du mâle, ainsi que la base et le bord abdominal des ailes, sont couverts de poils jaunâtres longs et soyeux.
- “ La frange des 4 ailes est uniformément de la couleur du fond des ailes et n'offre point le mélange de noir et de blanchâtre qu'on remarque dans *orleans*, *poeta*, et autres espèces.
- “ Le *Parnassius przewalskii*, Alphéraky, me paraît être l'espèce la plus voisine du *szechengi*.” (Oberthür, l. c.)

I received a long series of both sexes from the high plateau beyond Tachien-lu. They are all more suffused with blackish scales than Amdo specimens sent me by M. Grum-Grshimailo. The size and number of red spots on upper surface is subject to variation, and in some examples are yellow instead of the usual colour.

Parnassius orleans.

Parnassius orleans, Oberthür, Etud. d'Entom. xiv. p. 8, pl. i. fig. 2 (1891); op. cit. xvi. p. 3, pl. ii. fig. 14, ♀ (1892).

Parnassius orleans-groumi, Oberthür, l. c. pl. ii. fig. 10, ♂.

- “ Cette belle et nouvelle espèce appartient au groupe de *harbwickii*, Gray, et *prezawalskii*, Alphéraki, les “ Apollons aux yeux bleus.” Le *Parn. harbwickii* vole dans l'Himalaya et le *prezawalskii* a été découvert dans la chaîne Bourkane-Bouddha, au Thibet, par une altitude d'environ 14,000 pieds, suivant les renseignements que donne M. Alphéraky, dans les ‘Mémoires sur les Lépidoptères,’ par le grand duc Romanoff (v. p. 64).
- “ Le prince H. d'Orléans a pris le *Parnassius orleans* entre Litang et Tâ-Tsien-Loû, dans les premiers jours de l'été 1890. La description a paru dans une note spéciale que nous avons imprimée et répandue dans le public entomologique, à la date du 25 septembre 1890. Nous reproduisons cette description comme suit :—

- “ Taille d'*epaphus*; forme des ailes plus allongée; couleur du fond des ailes en dessus blanc jaunâtre; les supérieures ayant la frange entrecoupée de noir comme chez *epaphus*, mais beaucoup plus obscurcies par les atomes noirâtres; tri-punctuées de rougeâtre, comme chez *davidis*; les inférieures plus claires que chez *epaphus*, de Tartarie chinoise, n'ayant pas de tache rouge basilaire, comme dans la forme tartare de cette espèce, et se rapprochant, sous ce rapport, de la forme de Nord-Cachemir, mais bien distinctes de cette dernière et de la précédente par une rangée lunulaire submarginale de quatre taches intranervurales noires dont les trois premières sont pupillées d'atomes blanchâtres produisant un effet général bleuâtre. Les deux premières de ces taches sont assez irrégulières de contour; elles affectent cependant une forme générale arrondie; les deux dernières sont triangulaires.
- “ Le bord des ailes est marqué, au contact des nervures, de trois points noirs relativement assez allongés, et surmonté d'une bande ininterrompue de croissants intranervuraux transparents, plus petits et mal formés près du bord anal, mieux écrits au delà.
- “ Le dessous est jaune canari clair, luisant. Le dessus est exactement reproduit aux supérieures. Aux inférieures, la différence porte sur ce que les taches rouges du dessus sont entourées d'un mince liséré blanc, et en outre que le nombre des dites taches rouges est augmenté: 1° de quatre placées en escalier depuis le bord costal, contiguës à la base et au bord anal; 2° d'une cinquième grosse et allongée dans le centre de la tache noire qui est elle-même contiguë au bord anal et située dans le prolongement de la tache rouge isolée, extracellulaire, médiane.
- “ Les antennes sont noires; le corps en dessus et en dessous est couvert d'une épaisse fourrure de poils longs et jaunâtres.
- “ L'exemplaire que je viens de décrire me paraît être une femelle. La poche cornée, aplatie, comme le corps l'a été lui-même, semble courte et peu dilatée.” (*Oberthür, Etud. xiv.*)

Among some other specimens of *P. orleans* received by M. Oberthür, which were captured in 1891 in the mountains six or eight days' march beyond Ta-chien-lu, there were males exhibiting variation in the amount of black suffusion and in the development of the red spots; the females were darker than the males.

The species occurs in Thibet at various places somewhat distant from each other. M. Grun-Grshimailo met with it in the mountains of Amdo in 1891, and the specimens which he obtained differ from the typical form in being smaller and much paler; Oberthür describes this form as var. *grunni*, and it appears, from examples for which I am indebted to M. Grun-Grshimailo, to be a good local race.

I received a large number of specimens of *P. orleans* taken by native collectors in the high plateau to the north of Ta-chien-lu. I do not find that the females are generally darker than the males, but the red spots on primaries may be well-defined or only faintly indicated; in one female specimen they are entirely absent, and in another they are represented by a central series of seven yellowish spots on the primaries forming a curved interrupted band from costa to inner margin.

Parnassius przewalskii, an allied species, has been described by Alphéraky from the Bourkhane-Bouddha mountains, Thibet (Rom. sur Lép. iii. p. 403, 1887).

Parnassius delphius. (Plate XXXIII. fig. 4, var. ♂.)

Doritis delphius, Eversmann, Bull. Mosc. 1843, p. 541, pl. vii. figs. 1 *a*, *b*; Herr.-Schäff. Schmett. Eur. i. figs. 638, 639 (1852).

Parnassius delphius, Lang, Butt. Eur. p. 24 (1884).

Parnassius delphius, var. *elwesi*, 'Entomologist,' xxvi., Suppl. p. 104 (1893).

"Expands 2-12 inches. Whiter than *actius*. The fore wings have three black streaks in the discoidal cell. Two more external to this reaching from the costa; below the exterior one is a row of four black spots; the apex is dusky. Hind wings with two very small red spots; a row of black spots runs parallel to the hind margin. On the underside there is a very faint red spot at the inner margin of the hind wings (described from the figure in H.-S.).

"Habitat. Siberia." (Lang, *l. c.*)

Var. *elwesi*, Lecch. (Plate XXXIII. fig. 4, ♂.) *Male*. Larger than any of the named forms of *P. delphius*, but in some particulars it resembles var. *transiens*. It differs, however, from that insect, as it also does from any variety of *P. delphius* that I have seen, in having a red spot in the lower portion of the large black bar beyond the discoidal cell of primaries, and a patch of black scales between the usual discoidal spots; there are only the faintest possible traces of a black spot above the inner margin. On the secondaries the black basal area is deeply indented on its outer edge, and the marginal border is of uniform width throughout. Fringe white, chequered on the primaries with black at the ends of the nervules. Under surface glassy, with all the markings of upper surface faintly reproduced.

Expansion, 80 millim.

One example from the high plateau to the north of Ta-chien-lu.

Although I have referred this insect to *P. delphius*, I recognize the possibility of its proving to be a distinct species when a larger number of specimens, including the female, are available for examination.

P. delphius is an exceedingly variable species. Its headquarters appear to be the Central-Asian district between Samarkand and Kouldja. It occurs in the Hindu-Kush under a form which Grum-Grshimailo has named var. *hunza*, and is found at high altitudes in the N.W. Himalayas and S.E. Thibet, where it assumes the form known as var. *stoliczanus*, Felder. The following forms of the species have been described by various writers and most of them are figured by Austaut in "Les Parnassiens de la Faune Paléarctique,"—var. *namanganus*, Staudinger; var. *infernalis*, Staud.; var. *illustris*, Grum-Grshimailo; var. *cardinal*, Gr.-Gr.; var. *staudingeri*, Bang Haas; and var. *transiens*, Staud.

The habits and variation of the species are discussed at considerable length by Grum-Grshimailo in Rom. sur Lép. iv.

Parnassius imperator.

Parnassius imperator, Oberthür, Bull. Soc. Ent. Fr. 1883, p. 76; Etud. d'Ent. ix. p. 11, pl. i. figs. 4 a, b, c, ♀ (1884); xi. p. 15 (1886); xiv. p. 1, pl. i. fig. 1, ♂ (1891).

“*Femelle*: taille des plus grands individus d'*apollo*, des Pyrénées. Aux ailes supérieures, à peu près la même disposition de taches que chez *delphius*; mais les ailes beaucoup plus opaques, d'un blanc un peu jaunâtre et les taches noires très grosses et très fortement accentuées. Aux ailes inférieures, deux larges taches rouge carmin encadrées de noir ordinairement pupillées de blanc, quelquefois dépourvues de cette pupille blanche et alors complètement rouges, et deux autres taches arrondies, noires, sablées dans leur centre d'un épais semis d'atomes gris bleuâtre. Ces deux taches qui sont plus ou moins grandes et plus ou moins bleues sont, dans certains individus, prolongées dans une ligne endulée noirâtre assez large, remontant vers le bord costal, par deux autres taches également bleues, de taille et d'accentuation très variables. J'ai fait figurer l'aile inférieure d'un exemplaire chez qui ces troisième et quatrième taches bleues sont le plus accentuées.

“Les antennes sont entièrement noires.

“La poche cornée de la femelle seul sexe que je connaisse encore, est formée d'une caverne triangulaire, surmontée par une touffe anale épaisse, formée de poils serrés, noirs et jaunâtres. De plus, de chaque côté de cette caverne, une plaque cornée, couleur feuille morte, prenant naissance au-dessus du dernier anneau abdominal, se déroule de façon à former, vue en dessous, comme une espèce de paire de cornes se développant de chaque côté de la caverne centrale. J'ai fait figurer cette poche cornée très bizarre, vue de profil et en dessous.” (*Oberthür, Etud. ix.*)

“Le mâle diffère de la femelle qui est figurée dans les *Etudes d'Entomologie* (ix^e livr. pl. i. figs. 4 a, b, c) par une teinte générale plus foncée due à un semis plus serré des atomes noirs. Le thorax et l'abdomen sont entièrement couverts de poils longs qui s'étendent vers la base et sur le bord anal des ailes inférieures.

“Dans les femelles vierges, l'abdomen dépourvu de la poche cornée n'a pas de villosité comme dans le mâle; les anneaux abdominaux sont lisses noirs et chaque anneau est inférieurement liseré de blanchâtre.” (*Oberthür, Etud. xi.*)

The male of this species seems to be very much less frequently met with than the female, as among hundreds of specimens received from my collectors in China there were only a dozen males.

The locality in which it was most frequently met with was a small valley at no considerable elevation in the neighbourhood of Ta-chien-lu, and it was here that larvæ were found by Mr. Pratt on a species of *Corydalis* on May 13th. He describes the larva as follows:—“Dark slate in colour, with ten orange spots on each side, each spot with a black rim. It is covered with short grey hairs, and when touched curls itself into a ring. Its length is $1\frac{3}{4}$ inch. The pupa is brown, and is found attached by a silk web to the under surface of stones.”

It appears probable that soon after emerging from the pupa the perfect

insects ascend to higher altitudes, whence after pairing the females descend again to the breeding-ground to deposit their eggs. This supposition is based on my experience of an allied species, *P. charltonius*, of which I captured some numbers in Baltistan, North-west Himalayas. There both sexes were disporting themselves about the rugged grassy slopes on the very edge of the snow-line. Their flight was exceedingly rapid, and they were very difficult to capture, except when at rest on the rocks. In the hot gorges some thousands of feet lower I took a few specimens, but they were all females. The ground frequented at the higher elevation would be covered with snow during the earlier stages of the insect.

The variation of *P. imperator* is very similar to that of many others of the genus. The ocelli on the upper portion of the submarginal area of secondaries vary in colour from the deepest crimson to a palish orange, and the white centre may be either very large or entirely absent; these ocelli are sometimes connected by a black streak. The blue subanal ocelli vary in number from two to four, but two is the typical and more usual number. In addition to his type of *P. imperator*, Oberthür has figured on the same plate (fig. 4 c) an aberration with four subanal ocelli.

Occurs commonly at Ta-chien-lu, and more sparingly at Wa-shan and Wa-szu-kow in Western China. I have also received specimens from the high Tibetan plateau beyond Ta-chien-lu, and most of the males of this species that I have come from that locality. Grun-Grshimailo (Horæ Soc. Ent. Ross. 1891, p. 446) describes a form (var. *musgeta*) from the Amdo region.

Parnassius citrinarius. (Plate XXXIII. figs. 6 ♂, 5 var. ♀.)

Parnassius citrinarius, Motschulsky, Bull. Mosc. xxxix. p. 189 (1866).

Parnassius glacialis, Butler, Journ. Linn. Soc., Zool. ix. p. 50 (1866); Pryer, Rhop. Nilon. p. 5, pl. iii. fig. 5 (1886).

“Statura *Parn. stubbenloffi*, Ménétr., sed brevior. Corpore nigro, thorace ventreque dense citrinovilloso; alis subhyalinis, testaceo-albâlis, nervis nigris, mediis nigro pulverosis; alis posticis basi nigricantibus.” (*Motschulsky, l. c.*)

P. glacialis, Butler.—“Alæ supra subhyalinae, albæ, venis nigris: antice apice hyalino: cella media fasciata fasciæque brevi terminata, fasciis cinereis: postice margine abdominali late nigro: corpus nigrum, thorace præ ferrugineo: abdomine cinereo pilosato, a latere ferrugineo; antennæ nigre.

“Alæ subtus nitentes: postice margine abdominali cinereo; aliter velut supra: corpus nigrum, pilis ferrugineis sparsum.

“Alar. exp. unc. $\frac{6}{25}$ — $\frac{13}{216}$.” (*Butler, l. c.*)

There is little doubt that the above descriptions refer to the same insect, i. e. *P. citrinarius*, the only species of the genus so far known to occur in Japan. It is common at moderate elevations at Nikko, Central Japan, and at Hakodate in the Island of Yesso, where it occurs close to the sea-level. I have also received it from the Island of Kiushiu, Japan, and my collectors obtained it in Western China at Pu-tsu-fong, and at Chang-yang in Central China.

Considerable variation is exhibited. Some specimens from Hakodate have the black discoidal bars and the submarginal band entirely eliminated; all gradations between this form and typical specimens such as that figured (Plate XXXIII. fig. 6, ♂) are represented. A female example from Pu-tsu-fong (Plate XXXIII. fig. 5) is almost entirely melanic.

Staudinger (Rom. sur Léop. vi. p. 139) asserts most positively that this species is nothing but a form of *P. stubbendorffii*, Ménétriés*. If he were to compare good series of both species, he would discover the following points of difference:—*P. citrinarius* is uniformly larger, but not so rounded in the wing as *P. stubbendorffii*; the ground-colour is yellower, and there is always a distinct yellow collar: the under surface of the body is also more strongly marked with yellow than in any specimen of *stubbendorffii* that I have seen. In the female the pouch (Plate XXXIII. fig. 5) is much shorter and far darker in colour, almost black in fact.

Some well-marked specimens of *P. citrinarius* have a superficial resemblance to faintly-marked *P. felderi*, Bremer.

Fixsen (Rom. sur Léop. iii. p. 263) records this species from Corea, under the name of *P. stubbendorffii*, and states that it occurs there in July. There is also a specimen from Corea in Mr. Elwes's collection.

Genus LEPTOCIRCUS.

Leptocircus, Swainson, Zool. Ill. Ins. ii. p. 106 (1833); Doubleday, Gen. Diurn. Lep. i. p. 22 (1847).

* HEAD large; forehead broad.

* Eyes ovate, prominent.

* Ins. Lehm. p. 57, pl. vi. fig. 2 (1848).

M. Grun-Grshimailo has sent me specimens of *P. stubbendorffii* which he obtained in Amdo; these examples differ from Amurland examples in being less marked with black.

“*Maxille* rather long.

“*Labial palpi* very short, clothed with long loose scales; apparently triarticulate, but the articulations barely discernible.

“*Antennæ* rather long, slightly arched; club but slightly elongate, compressed.

“**THORAX** stout.

“*Anterior wings* triangular; the anterior and outer margins nearly equal, the inner about half the length of the anterior. Costal and subcostal nervules united at their origin; first subcostal nervule thrown off considerably before the middle of the cell; the second not far from its end; third and fourth at rather more than an equal distance beyond it, united at their origin for about one third of their course; upper discoecular nearly equal to the space between the two discoidal nervules, directed obliquely downwards and backwards; baseo-median not reaching the submedian nervule.

“*Posterior wings* folded longitudinally; the inner margin straight, nearly double the length of the abdomen, in the male folded back upon the wings and furnished with a tuft of delicate hairs; anterior margin about half the length of the inner; posterior margin sinuate, gradually produced into a long tail curving outwards at the extremity. Preecostal nervule branched, the inner directed forward, the outer anastomosing with the costal. Discoidal cell very short and narrow. Third subcostal nervule bent, and united to the third median nervule so as to seem to be a fourth median nervule.

“*Legs* rather long, slender. Anterior tibiæ with a stout spur near the middle, covered with scales. Tarsi rather longer than the tibiæ; the first joint equal to the three following combined; second and third nearly equal; fourth longer than these; fifth longer than the fourth. Tarsi of the second and posterior legs nearly double the length of the tibiæ; their first joints elongate; second, third, and fourth progressively shorter; fifth about equal to the third. Claws simple or bifid.

“**ABDOMEN** short, stout.

“This anomalous genus, place it where we will, interrupts the natural succession of the genera in the family to which it belongs. In the situation in which it is now placed it disturbs the very easy transition from *Papilio*, through *Eurygus* to *Parnasius*; but its affinities to some of the species of *Papilio* are so close, that we cannot, in a linear arrangement, interpose any other form between it and that genus.

“The venation of the anterior wings is very remarkable from the apparent bifurcation of the third subcostal nervule; an appearance due to the union, at their origin, of the third and fourth subcostal nervules. The posterior wings offer an equally striking character, the smallness of the cell, to which must be added the singular bend of the third subcostal nervule, which might cause it to be mistaken for a fourth median. This peculiarity and the structure of the posterior wings in *Leucophasia* and some other genera lead me to suspect that this nervule should be considered as quite distinct from

the subcostal nervules, and analogous to the discoidal nervules of the anterior wings.

“But the most striking anomaly in the genus is the totally different form of the claws in the only two known species, which are simple in the one species as is usual in this family, bifid in the other as is the case in the Pieridæ.” (*Doubleday, l. c.*)

Leptocircus curius.

Papilio curius, Fabricius, Mant. Ins. ii. p. 9 (1787); Donovan, Ins. Ind. pl. xlvii. fig. 1 (1800).

Erycina curius, Godart, Enc. Méth. ix. p. 561 (1823).

Leptocircus curius, Gray, Cat. Lep. Ins. Brit. Mus., *Papil.* p. 73 (1852); Distant, Rhop. Malay. p. 366, pl. xlii. fig. 1 (1886).

Primaries hyaline; the basal third is blackish, as also is the costa, the broad outer marginal border, and the neuration: the basal area is limited by a white band which becomes hyaline on its outer edge, and is followed by a blackish band decreasing in width towards inner margin. Secondaries black with a white band extending from middle of costa to the centre of the wing. Under surface as above, but the basal area of both wings is greyish, the pale band of primaries is almost entirely hyaline, and that of secondaries greyish; on the anal half of secondaries there are three greyish spots, and from the upper two of these there are indications of greyish bands traversing the wing in the direction of outer margin.

Expanse 40–45 millim.

I received a few specimens from Chang-yang in Central China, also one example from Wa-shan, and another from Chia-kou-ho in Western China.

Distribution. Continental India, Burmah, Siam, Malay Peninsula, Java, Borneo, Sumatra, Celebes, the Philippines, Central and Western China.

Genus TEINOPALPUS.

Teinopalpus, Hope, Trans. Linn. Soc. xix. p. 131 (1843); Doubleday, Gen. Diurn. Lep. i. p. 2 (1846).

Teinoprosoopus, Felder, Verh. zool.-bot. Ges. xiv. pp. 289, 331 (1864).

“HEAD large, produced anteriorly.

“Eyes oval, prominent.

“Maxillæ rather long.

“Labial palpi long, porrect, convergent; basal joint short, second long, clothed with scales and long hairs; third joint about half the length of the second, pointed, slightly bent downwards, clothed with appressed scales.

“Antennæ short, gradually clavate, arched: the club short, slightly truncate.

“ THORAX stout.

“ *Anterior wings* triangular, slightly falcate; the upper discocellular nervule very short; the lower discoidal nervule curving upwards; the third subcostal nervule thrown off precisely at the end of the cell; median and submedian nervules united by a baseo-co-median nervule.

“ *Posterior wings* dentate, caudate; the precostal nervule two-branched, the inner nervule bent downwards, and united to the costal nervule.

“ *Legs* moderately robust. Anterior tibiæ with a short stout spur, covered by a tuft of hair. Tarsi spiny, the first joint about equal in length to the others combined. Claws simple, curved.

“ ABDOMEN of moderate length, curved in the male.

“ This beautiful genus, of which one species only is yet known, may be distinguished at a glance from the others of this family by its long porrect palpi. There is little else in its structure to separate it from *Ovithoptera* or *Papilio*, though some of its peculiarities indicate an approach to *Thais*, a genus in which the palpi are more developed than in any other of the Papilionidæ, with the exception of *Teinopalpus*.

“ The posterior wings differ materially in the two sexes; in the male they are dentate, one-tailed, in the female three-tailed.” (*Doubleday, l. c.*)

Teinopalpus imperialis.

Teinopalpus imperialis, Hope, Trans. Linn. Soc. xix. p. 131, pl. xi. figs. 1, 2 (1843); Westwood, Arc. Ent. ii. pl. lix. (1843); Doubleday & Hewitson, Gen. Diurn. Lep. pl. i. fig. 1 (1846).

♀ *T. porryiæ*, Hope, Trans. Linn. Soc. xix. p. 131, pl. xi. figs. 3, 4 (1843); Westwood, Arc. Ent. ii. pl. lx. (1843).

“ *Alis viridi-pulverosissimis; anticis fascia tenui transversa mediana nigra extus flavo-marginata nebulisque duabus fuscis submarginalibus; posticis cauda unica terminatis macula magna mediana nigro-cincta squamulis cinereis lunulisque marginalibus flavis virilibusque; omnibus subtus aurantiis nigro-striatis dimidio basali viridi; posticis apicibus nigris griseo viridique variis.*

“ Long. corp. lin. 15; expans. alar. unc. 3 lin. 10.

“ *Habitat* in India Orientali, Silhet.” (*Hope, l. c.*)

I received two male specimens of this species from Chang-yang, Central China. One of these was captured by Mr. Pratt whilst it was resting on a moss-covered stone in the bed of a small stream where it was allowing the spray from a tiny cascade to fall upon its wings.

I believe that *T. imperialis* has hitherto only been met with in Sikkim, and Mr. Elwes gives the following interesting account of its habits in that district:—

“This splendid insect is peculiar to Sikkim, and is found only in the forest region from about 6000 to 10,000 feet elevation. Unless its habits are known, it is most difficult to capture, on account of its remarkably strong, rapid, and darting flight, and its habits of resting on high trees, from which it flies only during a few hours of the morning, during the rare intervals of sunshine which prevail in these cloudy, damp, and rainy forests. The female, which seldom or never flies in the same places as the male, is so extremely rare that, though for many years high rewards have been offered for it to the natives who make a business of catching insects, only six or seven in all are known to have been taken, and these mostly by chance in places outside the forest.

“In order to take the male, one must go early in the morning in the months of June, July, or August, to one of the few spots in the neighbourhood of Darjeeling where a little cleared space is found on the summit of a mountain top. Birch Hill, Sinchul, and Tonglo are all suitable places; but the top of Sinchul, called Tiger Hill, which is over 8000 feet elevation, is the best, as it is surrounded by a large tract of virgin forest. If the morning is bright and sunny, about 8 o'clock one may expect to see *Teinopalpus* flying round the tops of the trees, and occasionally settling, but usually out of reach. The natives lay baits of some evil-smelling nature to attract the insect, as is done in Europe to attract *Apatura iris*, and with patience and the skilful use of a long-handled net sometimes succeed in taking two or three in a morning in this manner. The insects are so strong and active in the net, however, that they are difficult to get in a perfect state, and always command a high price, even at Darjeeling. The flight is usually over by 11 A.M., even if the morning continues fine, which is very rarely the case during the rainy season. I have seen and taken *Teinopalpus* as high as 10,500 feet on the top of Tonglo, and also at Tendong and Rikisum, and I believe it occurs as far eastward as Buxa. The pupa has been found by Mr. Knyvett attached to the leaves of *Daphne nipalensis*, a plant which is used for making a fine strong paper in Nepal, and a female has been bred by him from one of these pupæ. This plant is probably the food-plant of the larva, and grows at 7-9000 feet in the virgin forests where the insect occurs.” (*Elwes, Trans. Ent. Soc. Lond.* 1888, p. 421.)

Genus ORNITHOPTERA.

Ornithoptera, Boisduval, Faune de l'Océanie, pl. iv. fig. 1 (1833); Doubleday, Gen Diurn. Lep. i. p. 3 (1846).

“HEAD large.

“*Eyes* large, round.

“*Maxillæ* of moderate length.

“*Labial palpi* closely pressed to the forecheek, short, obscurely triarticulate, covered with long hairs, the basal and apical joints very small, especially the former, which is barely discernible.

“*Antennæ* very long, gradually clavate; the club arched, slightly tapering towards the apex.

“THORAX very stout, the prothorax very distinctly developed.

“*Anterior wings* powerful, elongate, triangular; upper discocellular nervule about equal in length to the space between the two discoidal nervules; third median nervule mostly thrown off exactly opposite the end of the cell; median and submedian nervures connected by a baseo-median nervule.

“*Posterior wings* small in proportion to the anterior, subtriangular; the costa slightly rounded; the outer margin rounded, dentate; precostal nervure two-branched, the inner branch bent downwards and united to the costal nervure.

“*Legs* strong, elongate. Anterior tibiae with a very stout spur. Tarsi with the first joint about equal in length to the rest combined; fourth joint shortest; second, third, and fifth nearly equal. Claws simple, strong.

“ABDOMEN elongate, stout, the last segment always furnished in the males with two very large valves.

“LARVA tuberculate; the tentacula contained in a fixed bifid sheath.

“*Pupa* stout, slightly arched, tuberculate; head bifid.

“The species composing this genus are so closely allied to *Papilio*, that the propriety of separating them seems almost questionable. In the larva state they differ in having an external forked sheath for the prothoracic tentacula. The perfect insects have the prothorax more developed; the abdomen larger, longer, and very deeply grooved below, and the valves of the last segment far larger than in any species of *Papilio*.

“The larvæ, of which the discovery is due to Dr. Horsfield, resemble those of *Thois* and of some *Papilionæ* in being tuberculated. The pupa has the peculiarity of not being surrounded by a transverse band, but sustained by a silken thread on each side, attached to a small lateral tubercle.” (*Doubleday, l. c.*)

Ornithoptera rhadamanthus.

Ornithoptera rhadamanthus, Boisduval, Sp. Gén. i. p. 180 (1836).

Papilio rhadamanthus, Kirby, Cat. Diurn. Lep. p. 519 (1871).

Papilio minos, Oberthür, Etud. d'Entom. xi. p. 14 (1886).

“Taille d'*heliaco*, avec les ailes supérieures moins sinuées et l'angle anal des inférieures beaucoup moins arrondi et plus pointu. Ailes supérieures du mâle à peu près comme dans *heliaco*. Ailes inférieures presque triangulaires, d'un jaune d'or, avec les nervures noires et une bordure à dents de loup de la même couleur; celle-ci précédée, près de l'angle anal, d'atomes noirâtres. Sinus et échancrures entièrement noirs. Dessous des quatre ailes à peu près semblable au dessus; les inférieures sans atomes noirâtres. Tête et thorax noirs; un collier rouge sur le prothorax, près de la tête; abdomen noir en dessus et jaune en dessous; poitrine largement marquée de rouge à la base de chaque aile. Femelle un peu plus grande, à ailes inférieures plus larges, avec les échancrures liserées de blanc, et la bordure précédée d'un rang de taches ovales, à peu près comme dans la femelle d'*heliaco*, tantôt plus petites et tantôt plus grandes. Les ailes supérieures rayonnées de blanchâtre comme dans le mâle.

“*Var. A.* Femelle ayant la bordure entièrement confluyente avec les taches, de manière que les ailes inférieures sont noires, avec une grande tache jaune palmée, comme dans *helena*.

“Cochinchine et Manille. Coll. Bois.

“Cette espèce se distingue d'*heliaco*, par l'absence des échancrures blanches chez le mâle, par l'étroitesse de celles de la femelle, par la grandeur des taches rouges pectorales, et surtout par la forme presque triangulaire des ailes inférieures du mâle.” (*Boisduval, l. c.*)

Occurs commonly at Chang-yang and Ichang, Central China, and also at moderate elevations in Western China. Oberthür records it from Ta-chien-lu as *P. minos*. The Chinese specimens vary in size and also in the shade of the golden yellow of secondaries; the majority, however, agree in most respects with Sikkim examples of the species.

Mr. Elwes (Trans. Ent. Soc. Lond. 1888, p. 422) states that in Sikkim *O. rhadamanthus* is “common in the hot valleys at elevations varying from 2000 to 3000 feet, where it flies with a slow sailing flight about the flowering trees, which it frequents from May to October.”

Distribution. India, China, and the Philippines.

Genus PAPILIO.

Papilio, Doubleday, Gen. Diurn. Lep. i. p. 5 (1816).

“HEAD large.

“*Eyes* rounded, prominent.

“*Maxilla* often of considerable length.

“*Labial palpi* short, pressed closely to the fore part of the head, triarticulate; the last joint short, indistinct, all clothed with scales and long hairs.

“*Antennae* generally rather long, with an elongate arched club.

“THORAX rather stout; prothorax not strikingly developed.

“*Anterior wings* subtriangular, sometimes falcate, elongate, or rounded; the upper discocellular nervule about equal to the space between the two discoidal nervules; third subcostal nervule thrown off immediately opposite the end of the cell; median and submedian nervules united by a basco-median.

“*Posterior wings* subtriangular or rounded, sometimes gradually prolonged into a tail, more often with the outer margin rounded, more or less deeply dentate, with one or more of the teeth prolonged into a tail, sometimes of great length; the precostal nervule two-branched, the inner branch bent downwards and united to the costal.

“*Legs* generally long, powerful. Anterior tibiæ with a spine of various length, but always very distinct. Tarsi with the first joint generally equal in length to the rest combined; fourth joint shortest. Claws all simple.

“ABDOMEN moderately large, not much elongated.

“LARVA rather short, stout: the tentacula without any external sheath.

“*Pupa* supported by a filament passed entirely round it.” (*Doubleday, l. c.*)

Papilio xuthus.

Papilio xuthus, Linnæus, Syst. Nat. i. 2, p. 751 (1767); Lang, Butt. Eur. p. 20 (1884); Pryer, Rhop. Nihon. p. 2, pl. i. fig. 2 *b* (1886).

Papilio xuthulus, Bremer, Bull. Acad. Petr. iii. p. 463 (1861); Lep. Ost-Sib. p. 4, pl. i. fig. 2 (1864); Lang, l. c. p. 21 (1884); Pryer, l. c. fig. 2 *a*.

Primaries black; the discoidal cell has interrupted pale yellow longitudinal streaks from base to middle and two curved spots of the same colour beyond; there is a central series of yellow dashes, these dashes increasing in length from the fourth towards costa and inner margin respectively; the first dash is preceded by a spot of the same colour and encloses, as also does the second, a black spot; an angular pale yellow streak from base of the wing traverses the submedian interspace as far as the seventh central dash, with which it unites, and a straighter streak of the same colour along inner margin, interrupted towards base and terminating under the seventh dash; a submarginal series of eight pale yellow spots is preceded by a greyish interrupted band, and there is a cloud of the same colour between the first dash of central series and the costa. Secondaries have the pale yellow basal half broken up into spots by the broad black venation; the outer half is black, with a submarginal series of pale yellow crescents, a central series of bluish spots, and an orange spot at anal angle. Fringes pale yellow, interrupted with black at ends of nervules. Under surface of primaries black; discoidal cell outlined in yellow; markings as above, but the greyish band and cloud are replaced by yellow and the submarginal spots are very large and only separated from each other by the nervules; secondaries yellow; venation black, traversed by a black band which varies in width and is intersected by a series of bluish crescents; outer half of the tails black, and a broad black marginal line follows the contour of these wings.

Var. **xuthulus**. “Alæ flavæ, nervis late nigro-imbatis; posticæ dentatæ et caudatæ.

“Alæ anticæ supra prope basin nigro-striatæ; maculis discoidalibus tribus margineque posteriore, lunulas marginales flavas sex includente, nigris. Alæ posticæ fascia marginali nigra, œurulo-

atomosa, lunulis marginalibus flavis sex maculaque anguli ani fulva nigro-pupillata vel unicolore.

"Alæ antice subtus fascia marginali nigra strigis transversis flavis duabus interrupta. Alæ postice fascia dentata submarginali nigra cœruleo-atomosa, lunulis marginalibus cellularum 2-æ et 3-æ flavis, ceteris magnis, subquadratis, aurantiacis, nigro-marginatis, macula rotunda anguli ani eodem colore, unicolore vel vix nigro-pupillata. 63-67 m." (*Bremer, l. c.*)

Graeser* states that the larva feeds on *Phellodendron amurense*, and that it is greenish black with irregular milk-white spots and bands. When sitting on the upperside of a leaf the larva resembles the excrement of birds. In the summer of 1882 he took a number of larvæ of var. *xuthulus*, two of which attained the imago state at the end of September and were of the size of *xuthulus* with the typical *xuthus* markings. Pryer gives *Egle sepiaria* and *Xanthoxylon schimifolium* as food-plants of the larva of *P. xuthus*.

This is an exceedingly variable species, and ranges in expanse from 74-126 millim. in the male up to 130 millim. in the female. Some specimens are much suffused with black; in others the submarginal black band of secondaries is very wide, its inner edge extending to the discoidal cell as in *P. machaon*, var. *asiatica*. The ground-colour varies in tint from pale straw to deep yellow; in some examples taken by myself at Nagasaki in July the ground-colour is buff. Many specimens have hardly any trace of blue spots on the submarginal band of secondaries, and in such individuals the orange lunule at anal angle is absent.

The early spring form, var. *xuthulus*, is always paler in colour than the type, and has narrower black markings. It is usually considerably smaller, but some Chinese examples of this form expand as much as 112 millim. The submarginal yellow lunules of secondaries are not unfrequently suffused with orange, and there is often an orange spot in the first median interspace of these wings.

Intergrades between the typical form and var. *xuthulus* occur, and it is sometimes difficult to decide which form certain specimens represent.

A common species throughout the region dealt with in the present work.

Alphéraky (Rom. sur Léop. v. p. 94) records a female specimen, taken in July, from Hei-hò in the province of Kau-sou, and one male and two females taken in August at Loun-ngan-foù in the province of Sétchouen; these last, he remarks, do not differ from Amurland and Corean examples, but are not

* Berl. ent. Zeit. 1888, p. 62.

so large as certain individuals from Kiukiang, Central China, which I sent to him.

Oberthür (Etud. d'Ent. v. p. 11) mentions both forms from the Isle of Askold, and states that the specimens of *xuthulus* from that island are similar to those obtained by M. l'Abbé David in China.

Distribution. Amurland, Japan, Corea, China.

Papilio machaon. (Plate XXXV. fig. 2, var.)

Papilio machaon, Linnæus, Syst. Nat. i. 2, p. 750 (1767); Lang, Butt. Eur. p. 7, pl. i. fig. 4 (1881); Pryer, Rhop. Nihon. p. 3, pl. i. figs. 1 a, 1 b (1886).

Papilio sphyrus, Hübner, Ex. Schmett. figs. 775, 776 (1818-27).

Papilio machaon, var. *asiatica*, Ménétrics, Cat. Mus. Petr., Léop. i. p. 70 (1855).

Papilio hippocrates, Felder, Verh. zool.-bot. Ges. Wien, xiv. pp. 314, 362 (1864).

Papilio mikado, Pagenst. Verh. Heidelb. (2) i. p. 98 (1875).

Papilio tadakensis, Moore, Journ. Asiat. Soc. Beng. 1884, p. 46.

Papilio sikkimensis, Moore, l. c. p. 47.

Expands 2.50 to 3.43 in. Wings yellow. Fore wings black at the base, dusted with yellow, the hind margin with a broad black band, powdered with yellow, with marginal yellow lunules; nervures of wing black and distinct. Hind wings with the hind margin black, powdered with blue, and a marginal row of yellow lunules; this black margin has a well-defined edge internally. The eye at the anal angle is round or ovoid and well defined, being blue and dull red from above downwards. The tail straight and well formed. The body is yellow, with a black dorsal band. Antennæ black, with the clubs curved.

"Larva bright green, with deep black rings which are spotted with red; V-shaped process reddish. Feeds on fennel (*Anethum feniculum*) and wild carrot (*Daucus carota*), and other Umbelliferae. Appears from June to September.

"Pupa bright green shaded with buff, or buff shaded with brown." (Lang, l. c.)

A detailed life-history of this species, with figures of the larva in various stages and of the pupa, will be found in Buckler's 'Larvæ of British Butterflies.'

Var. *asiatica*, Ménétrics. "Cette variété diffère du *machaon* d'Europe en ce qu'en dessus les secondes ailes ont la bande noire postérieure très large et bien limitée; celle-ci part du bord antérieur et se dirige en ligne droite, atteignant presque la cellule discoidale, jusqu'à la lunule anale.

"De l'Himalaya et du Kamtchatka.

"N.B. Les individus de l'Himalaya présentent de plus, la bande noire du bord postérieur des premières ailes beaucoup plus large." (Ménétrics, l. c.)

Var. *hippocrates*, Felder. "Duas feminas e Japonia accepimus. Differt a *machaone* statura multo majore, fascia superiora multo angustiore, pallidiore, alis angustioribus, anticis apice.

posticis costa brevioribus, in regione anali multo magis porrectis, longius caudatis, maculis submarginalibus minus distinctis, macula anali a lunula atomaria caerulea optime separata, obscurius colorata, fascia maculari nigra paginæ inferioris alarum posticarum multo latiore, distinctiore, lunalis atomariis caeruleis apud eas multo latioribus, in medium fere macularum nigrarum positus, extus multo minus ab atomis sulphureis limitatis, fascia submarginali paginæ inferioris inerescente. Petiolus rami subcostalis quarti et quinti alarum antearum longior quam in *machaone* et cellula discoidalis omnium alarum longior." (*Felder, l.c.*)

In Japan the specimens of *P. machaon* that appear on the wing earliest in the year are all of the typical form, but the succeeding broods produce the variety *hippocrates* referred to above. This form is distinguished by its greater size and longer tails. The male is of a deep yellow ground-colour, and the female is suffused with black, sometimes to a great extent; the darkest examples of this form are found in Kiushiu, the southern island of Japan.

The principal feature of var. *asiatica*, Ménétrés, seems to be the broad black band of secondaries which extends inwards as far as the discoidal cell, and the same character distinguishes var. *sphyrus*, Hübner, of which I have several European examples in my collection. A modification of this form also occurs in England.

Chinese specimens of *P. machaon* do not exhibit such extreme divergence from the type as those from Japan. At a great elevation, however, in the mountainous districts of West China a short-tailed form (Plate XXXV. fig. 2 ♂) is found which closely approaches *ladakensis*, Moore*, from Ladak, but on the upper surface the black is deeper in tone; on the under surface the yellow colour is richer, the venation more intensely black, and there is a general absence of red spots on the submarginal area of secondaries. In both the Western Chinese form and in *P. ladakensis* the length of the tail is

* "*Male*. Distinguished from the N.W. Himalayan *P. asiaticus* by the absence of the elongated tail on the hind wing, which in this form is reduced to a short point but little more acute than the anal angle. The fore wing is comparatively narrower, and the hind wing is less convex and with less acutely sinuous exterior margin. On the upperside the yellow is also of a paler tint: fore wing numerously covered with yellow scales between all the markings, the cell-bands are shorter transversely and broader, and the inner cell-band is regularly quadrate; the discal bands also comparatively narrower and with more slender intervening black veins; the marginal row of spots is broader, and the intervening transverse discal area is narrower: hind wing with the outer border of the yellow basal area excavated between the veins, the marginal spots shorter and somewhat broader, the anal lobe-spot also smaller and broader.

"Expanse 3¼ inches.

"*Hab.* Tarlisam, Ladak. In coll. Indian Museum, Calcutta." (*Moore, l.c.*)

an exceedingly variable character, although this appendage is in all cases shorter than in typical *P. machaon*. There are also some very interesting aberrations of this species from China. In one example the black markings on the left pair of wings are bleached in appearance whilst the right pair are quite normal. Another specimen has the abdomen entirely yellowish white, as is the case in *P. podalirius*, var. *zancleus*, Zeller. In another specimen the black band on upper surface of abdomen is very narrow.

Ladakensis, to which reference has previously been made, is only observed in the N.W. Himalayas after the snowy ranges, which afford an impassable barrier to the monsoon, are passed. I first met with it on descending the Zoji-la Pass towards Dras. It was very abundant at intervals along the beds of streams, and seemed to be fond of congregating on wet patches of sand. Mr. de Nicéville, who accompanied me, netted over twenty specimens in one sweep, and these exhibited all kinds of modification in the length of the tail.

The form occurring in Kashmir and the outer ranges of the N.W. Himalayas agrees very well with some European specimens of *P. machaon*. Mr. Moore (Journ. Asiat. Soc. Beng. 1884, p. 32) describes a form of this species (*sikkimensis*) from Sikkim; and Mr. Elwes, referring to this form in his paper on the Lepidoptera of Sikkim (Trans. Ent. Soc. Lond. 1888, p. 437) states that it is "darker and more heavily marked than in Europe, smaller and more uniform in colour than in Japan;" and adds that it occurs at a great elevation, "probably from 8 or 10 to 12,000 feet and upwards."

Dr. Staudinger describes a form of *P. machaon*, from the neighbourhood of Margelan and also from Samarkand, as var. *centralis* (Stett. ent. Zeit. 1886, p. 193). He says:—"It is a form of the second brood which flies in those localities during June and July*; the first brood, composed entirely of typical specimens, flies in April and May." This variety is distinguished by a preponderance of the yellow ground-colour and more restricted character of the black markings; the black basal portion of primaries and the basal and inner marginal areas of secondaries are suffused with yellow; the abdomen of the male is almost entirely devoid of black markings. Some aberrant examples of *P. machaon* from China seem to be referable to var.

* M. Grun-Grshimailo (Rom. sur Léop. iv. p. 141) seems to be doubtful whether the specimens of var. *centralis* referred to above were taken at the time of year or in the place mentioned by Dr. Staudinger.

centralis. In the course of his remarks on this variety Dr. Staudinger* makes the astonishing statement that *macilentus*, Janson, is a form of *P. machaon*.

This species attains its maximum of size in the var. *hippocrates*, some examples of which measure over 120 millim. in expanse. Dwarf specimens are not of infrequent occurrence, and I have such examples from Kashmir and China.

Distribution. All the temperate parts of the Old World. In California it is represented by *P. zoliceaon*, Boisduval.

Papilio podalirius.

Papilio podalirius, Linnaeus, Syst. Nat. i. 2, p. 751 (1767); Hübner, Eur. Schmett. i. figs. 388, 389 (1798–1803); Lang, Butt. Eur. p. 5, pl. i. fig. 1 (1884).

Iphiclides podalirius, Hübner, Verz. bck. Schmett. p. 82 (1816); Scudder, Butt. New Engl. i. p. 1252 (1889).

Papilio podalirius, Oberthür, Etud. d'Eut. xiii. p. 97, pl. ix. fig. 99 (1890)

“Diffère de *podalirius* par l'extension plus grande de toutes les bandes ou flammes noires aux ailes supérieures en dessus. De plus le trait fauve qui, à la face inférieure des secondes ailes de *podalirius*, descend du bord costal, à côté d'un trait blanchâtre, entre deux lignes noires et s'arrête à l'extrémité de la cellule, est remplacé dans *podalirius* par une épaisse ligne carminée, et cette ligne carminée est reproduite en dessus au milieu d'une bande noire très clargie. Le croissant fauve qui surmonte dans *podalirius* la tache anale noire pupillée de bleuâtre, est remplacé dans *podalirius* par un croissant plus accentué et également carminé.

“*Podalirius* est sans doute la forme tibétaine de *podalirius*.” (Oberthür, l. c.)

The Chinese form of *P. podalirius*, described by Oberthür as above, differs from the type in having all the transverse black streaks or bands on primaries wider and more continuous and the central area of these wings suffused with dusky; on the secondaries there is a bright reddish band between the central black streaks, and the lunule above the anal spot is of the same colour.

Appears to be very rare and local. M. Oberthür's type was from Tse-kou, and I have one example which was taken at a considerable elevation in the neighbourhood of Ta-chien-lu.

* “Die in letzteren beiden Gebieten vorkommenden Machaon-Formen sind zum Theil unter eigenem Namen beschrieben und als verschiedene Arten angesehen worden. So *Macilentus* Jans. aus Japan, *Oregonius* aus Nordamerika etc.; doch sind diese fast weniger von typischen europäischen Machaon verschieden als die vorliegende var. *Centralis*, die ich besonders aus der Umgegend von Margelan, aber auch aus der von Samarkand erhielt.” (Staudinger, l. c.)

The early stages of *P. podalirius* are described by Lang as follows :—

Larva. "Yellowish green, covered with red dots, with yellowish lines on the back and sides and with oblique streaks. In shape it is thick in the middle and tapering towards the extremities.

Feeds on almond, sloe, plum, apple, pear, and oak in June and September."

Pupa. "Light straw-colour, the wing-cases being browner."

Distribution. North-Central and South-Central Europe, France, North Italy to Spain, South Russia, North Africa, Western Asia and the Altai (*Lang*), Western China.

Papilio mandarinus.

Papilio glycerion, var. *mandarinus*, Oberthür, Etud. d'Entom. iv. p. 115 (1879).

Papilio paphus, de Nicéville, Journ. Asiat. Soc. Beng. lv. p. 254, pl. xi. fig. 6, ♂ (1886).

"*Male*. Intermediate between *P. glycerion*, Gray, and *P. tamerlanus*, Oberthür. Differs from the former in being larger, the fore wing less profusely marked with black on the outer margin, both above and below, the hind wing having the disc crossed by a narrow black line, which is joined posteriorly to a continuous subbasal line, the wing-membrane between the discoidal nervule and the anal angle much broader. On the underside of the hind wing there is in *P. paphus* a series of six elongated streaks of the ground-colour divided by the nervules, from the costal nervule to the first median nervule outside the cell, these streaks being much shorter in *P. glycerion*, the ones in the costal, subcostal, and second median interspaces of that species being divided in the middle by a black bar into two spots, the anterior one in each instance being yellow, in *P. paphus* they are undivided and concolorous with the ground throughout. It differs from *P. tamerlanus* on the upperside (no figure is given of the underside of that species nor any detailed description) in having the two black bands at the end of the cell of the fore wing parallel and conjoined in the middle as in *P. glycerion*, the black bands of the hind wing much less prominent. It is also a smaller insect, but agrees with it in the rounded apex of the fore wing, and the width of the wing-membrane at the anal angle of the hind wing.

"Expanse ♂ 3 inches." (*de Nicéville, l. c.*)

Female. Usually larger and more transparent than the male, and the black markings are fainter. This sex is much rarer than the male, and has not been previously referred to.

Under the impression that this species was the Chinese form of the Indian *P. glycerion*, Mr. Oberthür described it as var. *mandarinus*. *Glycerion* does not, however, seem to occur in China, but is replaced in that country by a closely allied species which I have described as *P. eurous*.

Mandarinus is an exceedingly common insect in Western China. It is also found in Sikkim, and the specimens from thence (*paphus*) do not differ in any important particular from the Chinese examples.

Papilio eurous, sp. nov. (Plate XXXII. fig. 3 ♂.)

Allied to *P. tamerlanus*, Oberthür, and *P. glycerion*, Gray, but the apex of primaries is more acute than in either of those species. It is very similar to *tamerlanus* on the upper surface, but the black transverse bands have irregular edges; on the secondaries the black border of abdominal margin is more diffuse and less clearly defined, and the inner transverse black band is generally interrupted where it crosses the median nervure. On the under surface of secondaries it agrees better with *glycerion*, but the chain-like character of the central band is rarely continued below the median nervule. The tails are more slender than those of *tamerlanus*, and more broadly tipped with white than those of *glycerion*.

Expanse 80-84 millim.

The female is at present unknown.

I received about a dozen male specimens from Chang-yang, Central China, and one example from Moupin.

Papilio tamerlanus.

Papilio tamerlanus, Oberthür, Etud. d'Entom. ii. p. 13, pl. ii. fig. 1 (1876).

" Cette belle espèce a été découverte à Moupin, par M. l'abbé A. David. Elle est très-voisine du *Papilio glycerion*, Gray, dont elle a l'aspect général, mais elle en est distincte, ainsi qu'on peut en juger par la description comparative suivante :—

" Le *P. tamerlanus* est plus grand ; ses ailes supérieures sont plus arrondies au sommet. De plus, les bandes transverses noires, à l'aile supérieure, sont plus droites dans *tamerlanus*, surtout deux, l'une qui traverse la nervure qui clôt la cellule discoïdale, et l'autre qui se trouve immédiatement à côté de celle-ci, dans l'intérieur de cette cellule. Dans *glycerion*, ces deux bandes noires sont parallèles, rapprochées et réunies au milieu par un point de contact ; dans *tamerlanus*, au contraire elles sont plus largement séparées l'une de l'autre, et surtout plus écartées à la base, formant ainsi un V renversé.

" Δ l'aile inférieure, la différence caractéristique est le V formé par les deux bandes noires droites, dont l'une descend le long du bord abdominal (dont elle est séparée par une bande blanche et une bordure noire) jusqu'à la rencontre de la tache jaune bilobée qui surmonte le petit œil noir pupillé de bleu de l'angle anal, tandis que l'autre part du bord antérieur, traverse aux deux tiers de sa largeur la cellule discoïdale et va rencontrer la première au-dessus de la tache jaune précitée. Ce V manque dans *glycerion* ; certains exemplaires possèdent bien la bande qui longe le bord abdominal ; encore cette bande est-elle moins droite et plus sinuée ; mais la deuxième bande n'existe pas, et dans quelques individus seulement, on remarque quelques vestiges d'une bande ondulée qui transparait du dessous, où existe, dans *glycerion*, une bande très-sinuëuse, souvent double, et contenant alors des taches jaunes ovales, tandis que dans *tamerlanus* se trouve à la même place une bande toujours simple et très-droite. Les autres bandes de l'aile inférieure, placées près du bord extérieur, sont formées de croissants dans *glycerion* et sont au contraire droites dans *tamerlanus*. Enfin la queue est plus large dans *tamerlanus* ; le liséré blanc intérieur, non interrompu dans *glycerion*, est, au contraire, interrompu au milieu, dans *tamerlanus*, dont la queue est ainsi entièrement noire et sans bordure blanche dans les deux tiers environ de sa longueur.

“ En dessous, les différences signalées en dessus sont reproduites, puisque le dessous reproduit les dessous du dessus.

“ Je possède deux exemplaires absolument pareils du *P. tamerlanus*.” (*Oberthür, l. c.*)

The female, which has not been previously described, only differs from the male in the rather yellower tint of the ground-colour, and in the black markings being paler; this sex is exceedingly rare, as among a large number of specimens there was only one female. *Tamerlanus* can at once be separated from its allies by the straight central line of secondaries, which has no tendency to form loops on the under surface; the space between the two submarginal lines on primaries is frequently suffused with black, and in some specimens is entirely filled up with this colour.

Fairly common at Moupin, Wa-ssu-kow, and Chow-pin-sa in Western China.

Papilio alabion.

Papilio alabion, Gray, Cat. Lep. Ins. Brit. Mus. p. 30, pl. xiii. fig. 6 (1852).

Papilio mariesi, Butler, Ann. & Mag. Nat. Hist. (5) vii. p. 33, pl. iv. fig. 4 (1881).

“ The primary wings yellowish white, with six bands across the wing black; the first and second bands extend to the inner margin, the third to the fifth are short and reach only to the median nervure; the outer margin very broadly bordered with black, which is divided in its whole length by two bands of yellowish white, and at the inner anterior angle by a short narrow band of the same colour. The secondary wings are yellowish white, having the first and second bands of the primary wings continued to the anal angle, where they unite; the outer margin is bordered with black, having two short lines of yellowish white at the anterior angle, but towards the posterior part of the inner margin it is ornamented with yellowish-white and grey lunules; the anal angle has a large patch of bright yellow with a black lunule, having a grey lunule in the middle.

“ The under surface of all the wings is very similar in colour and markings, but the outer margin is less black: the commencement of the middle band of the secondary wings has a bright yellow spot, margined internally with white and outwardly with black; and below this spot is a short white line on the outward side of the band; the patch at the anal angle is partly white and partly yellow.

“ This species is allied to *P. glycerion*, but the wings are of a more slender form.

“ In Collection (Brit. Mus.) from Northern China.” (*Gray, l. c.*)

Var. *mariesi*, Butler. “ Allied to *P. alabion*, from which it differs in the absence of the submarginal black band on the primaries, the narrower discal belt of secondaries, which is greyish externally, and becomes obsolete towards the costa, the slightly larger white spots above the blue-centred marginal black spots of the secondaries, and the slightly larger and deeper-coloured orange subanal patch; on the under surface the primaries differ as above, the outer discal line of the secondaries is obsolete, and the marginal black stripe encloses a much smaller spot of the ground-colour at apex. Expanse of wings 2 inches 10 lines.

"Lu Shan mountains, province of Kiukiang, China.

"One sp." (*Batler, l. c.*)

Gray's figure of *P. albion* is too highly coloured. The differences claimed for *mariesi* are of a very unimportant character; there are indications of the submarginal black band in the type of this form, which was taken at the same time and place as a series labelled *albion* from Kiukiang in the National Collection.

The submarginal area is in some specimens of *P. albion* suffused with blackish.

Mr. Pratt failed to meet with this species at Kiukiang, and I have not received it from any of the other places in China visited by my collectors.

This and the three preceding species are referable to the genus *Pazala*, Moore*, the type of which is *P. glycerion*, Gray.

Papilio cloanthus. (Plate XXXII. fig. 2 var.)

Papilio cloanthus, Westwood, Arc. Ent. p. 42, pl. xi. fig. 2 (1845).

"*P. alis elongatis, anticis apice acutis, posticis caudatis; nigris, fascia media communi subaurea argenteo-virescenti, versus apicem anticarum in maculis 4 divisa, posticis maculis submarginalibus concoloribus.*

"Expans. alar. unc. 3½. Habitat in partibus septentrionalibus Indię orientalis.

"The wings above are almost black, the centre marked with a very broad fascia, common to each, of a whitish-green tint, but almost transparent. The extremity of this bar is broken in the apical half of the fore wings into four patches of unequal size, the first divided transversely, and the second longitudinally by the veins. The hind wings are moreover ornamented with four unequal-sized patches of similar colour, and the incisions between the tail and anal angle are edged with white.

"The underside is paler brown, with similar silvery-green semitransparent spots. In addition to which the base of all the wings is also slightly green, and the fore wings have a pale line near to the outer margin; near the base of the hind wings are also three small and slender red lunules edged with black. At the extremity of the discoidal cell are also several black spots edged with dull pinkish red, a similar spot is at the anal angle, and another at the side of the first green patch. The body beneath is pale greyish green. The abdomen whitish with a black bar on each side." (*Westwood, l. c.*)

As the Chinese specimens do not quite correspond with Indian examples of *P. cloanthus* I describe them as a local race of that species under the name

Var. **clymenus**, var. nov. (Plate XXXII. fig. 2.) Larger than the type, expanding over 100 millim. in both sexes. The green markings are more restricted and distinctly interrupted by the neurulation; the median nervure is black instead of whitish as in the type.

* New Ind. Lep. Ins. p. 283 (1888).

I have received a considerable number of specimens of this form from Chang-yang in Central China, and from various localities in Western China. No variation of any importance is exhibited.

In his "Catalogue of the Lepidoptera of Sikkim" (Trans. Ent. Soc. Lond. 1888, p. 434) Mr. Elwes remarks:—"Möller gives the habitat of this species (*P. cloanthus*) as from 2-4000 feet, and its occurrence as from April till October, but I should consider it as rather a temperate than a tropical butterfly having only seen it at about 6000 feet. Capt. Lang says in the N.W. Himalayas it occurs from 5-7000 feet, and Doherty found it in Kumaon from 2-7000 feet. I saw it in Khasia at 6000 feet, flying on sunny days round the tops of trees with very rapid flight, and hard to catch."

Distribution. Himalayas; Western and Central China.

Papilio sarpedon.

Papilio sarpedon, Linnaeus, Syst. Nat. i. 2, p. 747 (1767); Distant, Rhop. Malay. p. 359, pl. xxxii. fig. 6 (1885); Pryer, Rhop. Nihon. p. 5, pl. i. fig. 9 (1886).

Papilio teredon, Felder, Verh. zool.-bot. Ges. Wien, xiv. p. 305 (1864); Reise Nov. Lep. i. p. 61 (1865).

Dalchina teredon, Moore, Lep. Ceyl. i. p. 143, pl. xlii. figs. 1 a, b (1881).

"*Male and female.* Wings above blackish; both wings crossed by a pale green discal fascia, which on the anterior wings is narrowed, broken, and macular above the median nervules, and on the posterior wings is narrowed and elongately angulated beneath the median nervure; posterior wings with a submarginal series of lunulate green spots and three narrow pale greyish fringe-like spots at anal angle. Wings beneath paler than above; posterior wings having the base of the green fascia inwardly margined with a black and red spot; a black spot outwardly margined with red occupying apex of cell, between which and the submarginal green spots there is an irregular series of blackish spots which from cell to anal angle are more or less marked with carmine-red. Body and legs more or less concolorous with wings; legs more or less greyish.

"Exp. wings, ♂ and ♀, 72 to 85 millim." (*Distant, l. c.*)

Var. *teredon*. "*Male and female.* Black: fore wing with a medial row of emerald-green spots from the apex to the posterior margin, which are broader and quadrate but not separated hindward, the two lower spots also being of a bluish tint; hind wing with a medial transverse bluish-green band, the broad costal end of which is whitish, and a submarginal row of four slender lunules. Underside cupreous brown, with glossy bands as above: hind wing with a crimson-bordered black spot at the costal inner end of the band, and four similar lunular spots from the cell to below end of the band, and another spot at anal angle.

"Expansion, ♂ 3, ♀ 3½ inches.

"Larva smooth, green, with a paler lower lateral line, and a yellow dorsal band ending in a lateral tubercular spot on fourth segment; a pair of short tubercles on front and anal segments.

Pupa green, with lateral and dorsal longitudinal yellowish streaks. Feeds on *Cinnamomum*." (Moore, l. c.)

Common throughout Central and Southern Japan, and Pratt and Kricheldorf obtained it in most of the places in which they collected in China. It has an exceedingly rapid flight, but is fond of settling on flowering shrubs, and on wet places on roads, when its capture may be effected. There are several broods in the year, and the butterfly is on the wing almost throughout the summer.

In Japan the individuals of the first brood are usually smaller than those occurring later in the year. The transverse band varies in width and is more distinctly interrupted in some specimens than in others. Mr. Butler (Ann. & Mag. Nat. Hist. (5) vii. p. 133) records *P. terodon*, Felder, from Nikko in Central Japan; this is the Ceylon form of the species, and, according to Moore's figure, only differs from typical *sarpedon* in the narrower band, and in having the anal angle of secondaries more produced.

The species is also exceedingly variable in China. Some specimens agree with examples from Japan, while others have all the usual bluish markings replaced by yellowish green. A common form of variation is the more or less complete absence of the bluish central band on secondaries; an extreme example of this form is figured in the 'Transactions of the London Entomological Society,' 1889, pl. vii. fig. 2. An intermediate form has been described by M. Honrath as var *semifasciatus*:—"Die Hinterflügel haben statt der Mittelbinde nur den grossen weissen Vorderrandflecken und daran nur eine, besonders auf der Oberseite ganz schwache Andeutung eines zweiten Fleckens." (Honrath, Ent. Nach. 1888, p. 161.)

Pryer says that the larva feeds on the evergreen *Machilus thunbergii*, and that it closely resembles the young leaves in colour.

Distribution. Continental India, Ceylon, Malay Peninsula, Penang, Perak, Malacca, Sumatra, Java, Borneo, Philippines, Celebes, Amboina, Aru Islands, New Guinea, Formosa, Cachar, China, and Japan.

Papilio bathycles.

Papilio bathycles, Zinken-Sommer, Nova Acta Ac. Nat. Cur. xv. p. 157, pl. xiv. figs. 6, 7 (1831); Horsfield & Moore, Cat. Lep. Mus. E. I. C. i. p. 114 (1857); Distant, Rhop. Malay. p. 362, pl. xxxii. fig. 2, ♂ (1886).

♂ *Male.* Wings above black, with the following pale green markings:—Anterior wings with five

spots in cell—the one at apex small and rounded, the others more or less linear,—a discal oblique row of eight spots commencing just beyond end of cell and terminating on inner margin—of these the third spot is smallest, and the sixth, seventh, and eighth much the largest, the last two being more or less fused together,—a small subapical spot and a submarginal row of still smaller spots; posterior wings with the basal half of costal area greyish, three large discal spots,—the largest in cell, the smallest above cell, and the other situate between the two lower median nervules,—a submarginal row of small spots and a large greyish patch on abdominal margin, fringe alternately greyish. Wings beneath paler than above, the spots silvery in hue; anterior wings spotted as above; posterior wings with the three discal spots continued to costa in a large silvery patch, yellowish at base, and traversed by two dark fuscous fasciæ,—one near base parallel with abdominal margin, the other concave at about centre of wing,—between these fasciæ the median nervure is broadly blackish; beyond cell and extending to a little above anal angle are a series of red spots, the innermost of which is followed by a small greyish spot; the submarginal spots much larger than above, with two additional linear spots situate one on each side of the upper subcostal nervule. Body above with the head and pronotum blackish; the abdomen fuscous; body beneath greyish; legs greyish, streaked with blackish.

“Expanse ♂ 74 millim.” (*Distinct, l. c.*)

I have only received one example of this variable and wide-ranging species from China. It was taken at Chang-yang, and differs from all other examples of *P. bathycles* that I have seen in having the spots of central series on primaries narrower and more elongate.

Distribution. Malay Peninsula, Penang, Perak, Malacca, Singapore, Java, Borneo, Sikkim, Bhotan, Nepal, the Khasias, and China.

Papilio mikado. (Plate XXXII. fig. 6 ♀.)

Papilio mikado, Leech, Proc. Zool. Soc. Lond. 1887, p. 406, pl. xxxv. fig. 1.

Ground-colour of all the wings black; a narrow straw-coloured streak extends across the basal area of the fore wing interrupted by the nervures. All the wings covered with straw-coloured spots consisting of a submarginal series of fairly uniform spots running round the outer margin of the wing; a subcostal series of eight spots, three of which are situated in the discoidal cell, a discal series of six graduated spots on the fore wing, which is continued on the hind wing in a wedge-shaped mass, tapering to a blunt point near the anal angle and divided into two by the median nervure; the first two spots of the submarginal series of the hind wing, the anal lunule, the upper part of the wedge-shaped mass, and the interior of the abdominal fold are very pale yellow. Underside, a reproduction of the upper surface, with most of the spots enlarged and whiter, and with the addition of a yellow spot at the base of the hind wing and an irregular arrangement of yellow markings between the discal and submarginal spots of the hind wing.

Expanse $2\frac{1}{2}$ inches.

I took one female example of this species in 1886, about May 20th, near

Kagoshima, in the Province of Satsuma. This was accidentally referred to as a male in the original description.

This species, together with *P. bathycles*, is referable to the genus *Zetides*, Hübnér, as characterized by Moore, Lep. Cycl. p. 144.

Papilio bianor.

Papilio bianor, Cramer, Pap. Exot. ii. pl. ciii. fig. C (1777).

Papilio dehaanii, Felder, Verh. zool.-bot. Ges. Wien, xiv. pp. 323, 371 (1864).

Papilio alliacnon, de l'Orza, Lep. Jap. p. 9 (1869).

Papilio bianor, var *japonica*, Butler, Journ. Linn. Soc., Zool. ix. p. 50, note (1866).

“Le fond des ailes en dessus est d'un brun obscur, avec des atomes verts luisants, qui y sont parsemés. En dessous les ailes ne diffèrent en couleur ni en dessin de la Figure B [*P. paris*]. La Figure que nous donnons ici est faite d'après l'original qui se trouve dans la collection de Mr. le Ministre E. F. Alberti; mon neveu, Mr. Anthony van Renfelaer Willemiz, possède pareillement un de ces beaux Papillons, qui l'a reçu, parmi plusieurs autres insectes, de la Chine.” (*Cramer, l. c.*)

Male. Black, powdered with green scales, thickly so on outer area of the primaries and on the inner half of secondaries; there is a broad patch of black velvety pile on the first and second median nervules, the submedian nervure, and in the submedian interspace; the third median nervule has a narrower patch, and there is a black streak in each interspace above and also between the second and third nervules; fringes white. Secondaries have the costal area suffused with bright blue and a submarginal series of connected blue lunules followed by reddish ones; the lower horn of the fourth and the upper horn of the fifth blue lunules are prolonged nearly to the end of the tail; the outer margin is sinuate and the fringes of each sinus are white. Under surface: primaries are blackish on basal half and greyish on outer half; the venation is black and there are black rays between the veins; a white patch at inner angle; secondaries blackish, the basal half sprinkled with ochreous scales; there is a series of seven reddish submarginal lunules edged internally with mauve; the third nervule is bordered on each side with blue throughout the length of the tail; the seventh lunule is often replaced by a large reddish patch enclosing a round spot of the ground-colour.

Female. Primaries fuliginous grey, powdered with bronzy-green scales; secondaries black, sprinkled with bronzy-green scales on the basal half, and suffused with bluish-violet on the costal area; the submedian lunules are reddish, with the exception of the first two, which are bluish, and sometimes the lower lunules are tinged with this colour.

Expanse, ♂ 120–160 millim., ♀ 126–166 millim.

The above descriptions refer to the sexes of the summer brood of *P. bianor* from China. The individuals of the spring brood from the same country, which do not seem to have been previously noticed, are smaller, ranging in expanse from 97 to 114 millim. in the male, and from 100 to 118 millim. in the female. Cramer's figure appears to represent a female specimen of the summer brood.

Var. **dehaani**, Felder. "A *bianore*, Cram., cum quo cl. De Haan colore et signaturis fortasse deceptus confundit, longe diversus et *P. maackii*, Ménétr., valde similis, facile tamen dignoscendus lunulis submarginalibus paginae inferioris alarum posticarum a margine multo magis remotis.

"Vena et plicia interna ramique mediani alarum anticarum maris in *P. maackii* valde tomentosi apparent, et maculae tres inferiores tomenti in unam fere conjunctae sunt. Specimen nostrum *P. raddei*, Brem., ibidem parce tantum tomentosum est." (*Felder, l. c.*)

Var. **alliacmon**, de l'Orza. "Très-voisin du *bianor*, dont il n'est peut-être qu'une modification locale d'un tiers plus petite. Il diffère de cette espèce chinoise en ce que chez le mâle les trois croissants de la région abdominale sont surmontés d'une petite lunule violette." (*De l'Orza, l. c.*)

Var. **japonica**, Butler. "Ae anticae subtus late fuscae: posticae caudis vix spathatis; supra macula anali minus conspicua; subtus prope marginem luteo rotatae, maculis submarginalibus minus lunulatis, macula anali his haud distinguenda." (*Butler, l. c.*)

This species exhibits considerable variation in the male. Some specimens have very bright green scales thickly powdered over all the wings; in others the green scales are dull in tone and on the secondaries are eclipsed by the more vivid tint of the blue colour on costal area of these wings. Green scales are sometimes interspersed with the blue ones forming the submarginal lunules; these blue lunules are not always well defined and the lower ones are sometimes entirely replaced by the reddish colour, which, in other specimens, is sometimes present in a greater or lesser degree, forming an outer edging to one or more of the lunules. The blue colour, usually restricted to the immediate vicinity of the nervule, is in some specimens diffused over the greater portion of the tail.

The Japanese summer form of *P. bianor*, which has been described as *dehaani* by Felder, differs principally from the type in having the basal half of primaries, on under surface, blacker, more clearly limited outwardly, and the grey of outer half of these wings is whiter, broadly bordered exteriorly with black, and forms a tapering band to inner margin. The Japanese spring form is *japonica*, Butler, which, like the Chinese spring form, is much smaller than the type, and exhibits the same differences on the under surface as noted in the Japanese summer form. *Alliacmon*, de l'Orza, is also referable to the Japanese *P. bianor*, and, as it is said to be a third smaller, probably to the spring brood, i.e. *japonica*, Butler.

Distribution. Northern and Western China; Japan.

Papilio maackii.

Papilio maackii, Ménétrés, Bull. Acad. Petr. xvii. p. 212 (1859) ; Schrenck's Reisen, ii. p. 10, pl. i. figs. 1, 2 (1859) ; Bremer, Lep. Ost-Sib. p. 3 (1864).

Papilio raddei, Bremer, Bull. Acad. Petr. iii. p. 462 (1861) ; Lep. Ost-Sib. p. 3, pl. i. fig. 1 (1864).

Papilio dehaanii, var. (?) *tutanus*, Fenton, Butler, Proc. Zool. Soc. Lond. 1881, p. 855.

“ Alis nigro-brunneis, viridi-irroratis cœruleo-micantibus ; ante marginem externum fascia viridinitente radiatim interrupta, maris sub angulo interne plaga magna velutino-nigra ; posticis dentatis, caudatis, fascia media transversa viridinitente vel cyaneo-micante, lunulisque septem in mare viridibus, in femina violaceo-rubris, instructis.

“ Enverg. 4 pouces—4½ pouces.

“ En dessus les ailes sont noires, et saupoudrées d'atomes qui apparaissent d'un vert doré lorsqu'on regarde l'insecte en tournant le dos à la lumière ou bien d'un beau bleu foncé si le papillon se trouve placé entre la lumière et l'observateur ; ce que ne présente que la tache des ailes inférieures du *polyctor*. Nous décrirons l'insecte éclairé de côté : ces atomes sont un peu moins serrés que chez le *polyctor*, et forment comme chez cette espèce une bande transversale sur les ailes supérieures, et non loin de leur bord externe ; cette bande se distingue cependant de celle du *polyctor* en ce qu'elle est plus étroite et interrompue par les nervures qui sont noires. (Cette bande manque chez le *bianor*.) De plus, l'on remarque chez le mâle seulement un espace cotonneux, noir, presque carré, à peu près comme chez le *bianor*. Les ailes inférieures ont près de leur bord antérieur un reflet bleuâtre, mais qui ne forme pas, comme chez le *polyctor*, une tache en miroir, mais au contraire aboutit à une bande étroite qui parte de l'angle externe, traverse l'aile jusqu'à l'œil anal ; cette bande plus ou moins large présente sa moitié antérieure bleuâtre, et l'autre moitié ou interne de couleur verte ; cette bande est bordée inférieurement par un large espace d'un beau noir velouté chez le mâle, moins brillant chez la femelle, et qui est limité inférieurement par une rangée de six lunules, qui, chez le mâle, sont formées d'atomes d'un vert bleuâtre, à peu près comme on le voit chez le *bianor*, si ce n'est que ces lunules sont souvent peu convexes, surtout celle qui surmonte le prolongement en queue et qui est plutôt concave ; cette queue, chez les deux sexes, est également marquée longitudinalement d'un raie d'un vert bleuâtre ; chez la femelle, les quatre lunules les plus internes sont remplacées chacune par un large trait rouge ; chez quelques individus, ces taches rouges s'oblitèrent en partie et sont remplacées par des traits verdâtres ; l'œil anal est formé d'une grosse prunelle noire, surmontée chez le mâle d'un étroit violet, souvent très peu marqué, mais toujours entourné d'un trait bleuâtre, encadré enfin d'une ligne noire, mais chez la femelle la prunelle est plus large, et surmontée d'une bande d'un rouge qui se nuance de violet jusqu'au large cercle noir qui encadre le tout.

“ En dessous, les ailes supérieures, chez le mâle, diffèrent de celles du *bianor*, en ce que l'éclaircie blanchâtre forme une bande étroite correspondant à la bande verdâtre du dessus. Les ailes inférieures sont saupoudrées de vert jusqu'aux deux tiers de leur longueur, d'une manière bien limitée, surtout chez quelques exemplaires n'importe le sexe, par une bande étroite formée d'atomes plus serrés ; entre celle-ci et la rangée de lunules, sur toute l'étendue de la largeur de l'aile, se voit un espace, d'un beau noir, qui devient un peu plus clair près des nervures et sur celles-ci, espace qu'on ne remarque ni chez le *bianor* ni chez le *polyctor* ; ces lunules qui ont la forme de celles du *bianor*, et en général plus larges chez la femelle, sont comme chez le *polyctor*, d'un rouge plus orangé chez la femelle, et chacune surmontée d'un liséré rosé ; l'œil

anal est toujours bien marqué chez les deux sexes, et consiste en un gros point rond, très noir, surmonté d'un large iris d'un rouge orangé, lequel est limité par une ligne d'un rose violet qui se recourbe extérieurement jusqu'à la frange, et le tout encadré d'une ligne noire; il y a indépendamment au dessous de la pupille, dans la première échancreure, une tache d'un rouge orangé qui est plus large chez la femelle.

- “ Les quatre ailes sont frangées d'un blanc brillant au bord externe des supérieures, et aux échancreures des inférieures, mais chez les femelles ces échancreures sont d'un fauve clair en dessous: ces ailes présentent leurs dents plus larges que chez le *polyctor*, surtout chez la femelle où elles sont plus arrondies à leur extrémité.
- “ Le corps est noir, saupoudré en dessus et sur les côtés d'atomes verts, mais la ligne longitudinale noire est moins sensible que chez le *polyctor*.” (*Ménétrières, l. c.*)

Var. *tutanus*, Fenton. “ *Male*. Primaries sharper above than typical *P. dehaani*; the scattered atoms are slightly brighter and greener and are aggregated in a transverse discal bar: below, the broad whitish discal dash of the primaries of *P. dehaani* much narrower and less distinct, and obsolete in some specimens: the scattered ochreous scales of the secondaries are somewhat paler and are aggregated (densely in some examples) in a curved transverse discal bar; the violet scales overarching the red submarginal lunules more numerous. There is the same difference between the sexes; both sexes vary in a like degree *inter se*. Generally larger. Expanse of wings, ♂ 4 inches 8 lines to 5 inches 6 lines, ♀ 5 inches 6 lines to 5 inches 9 lines.

“ The summer brood makes its first appearance about the 26th of July, and is on the wing till the middle of September.

“ *P. tutanus* and *P. dehaani*, near Hakodate, in the south of Hokkaido, are found feeding together on the same excrement, though I never saw the males of the latter in conflict with those of *P. tutanus*, or chasing the females, or *vice versa*. Further north I did not see a single specimen of *P. dehaani*, and *P. tutanus* became more abundant.” (*Fenton.*)

“ Toshima and Iburi, Hokkaido [Yesso]. Colls. Fenton and B.M.” (*Butler, l. c.*)

Male. Agrees with *P. bianor* in the character of sexual marks, but differs somewhat in colour. Primaries black, thickly powdered with green scales and traversed by a submarginal band formed of paler green scales. Secondaries black, costal area suffused with blue, inner and median areas powdered with green scales: there is a central band of paler green tinged with blue on costal area; submarginal lunulated band bluish green, and this colour is projected along the third median nervule almost to the extremity of the tail; there is a more or less complete reddish ring at anal angle; outer margin sinuate; fringes white as in *P. bianor*. Under surface fuliginous; primaries traversed by a broad pale ochreous band interrupted by the neurulation and internervular streaks; secondaries have the basal area sprinkled with ochreous scales and are traversed by a broad pale ochreous central band interrupted by the veins; there is a submarginal series of six reddish marks and a more or less complete reddish ring at anal angle; fringes of each sinus ochreous, sometimes tinged with reddish at their base.

Female. Primaries powdered with bronzy-green scales and with a pale, broad, submarginal band; secondaries also sprinkled with bronzy-green scales; submarginal lunules reddish, except the first two, which are bluish or greenish.

Expanse. ♂ 140–150 millim., ♀ 136–150 millim.

Var. *raddei*, Bremer. "Alæ supra nigre viridi-atomose, ciliis albis; posticæ dentatæ et caudatæ. Alæ anticæ supra fascia submarginali flavo-viridi nervis nigris interrupta; angulum interiore versus plaga velutino-atra. Posticæ ad marginem anteriorem cornuco-micantes, fascia viridimicanti ab angulo exteriori ad angulum analem ducta; lunulis marginalibus viridimicantibus sex, in cellulis 2da, 4ta, et 5ta posticæ rubro-fulvo marginatis; macula rotunda anguli ani rubro-fulva, nigro pupillata, supra violaceo ornata.

"Alæ subtus nigro-fuscæ, flavo atomosæ.

"Alæ anticæ fascia lata submarginali flava nervis nigris interrupta.

"Alæ posticæ fascia submarginali subarcuata flava; lunulis marginalibus sex rubro-fulvis anticæ violaceo marginatis; macula angulo ani rubro-fulva, nigro pupillata, anticæ violaceo marginata. 70–80 m." (*Bremer, l. c.*)

This form is best distinguished from the type by its smaller size. Japanese specimens range from 100–115 millim. in expanse.

In my paper on the Butterflies of Japan and Corea (Proc. Zool. Soc. Lond. 1887) I considered *bianor* and *maacki* to be forms of one species; but now that I have examined a very large number of the former from China and Japan and an extensive series of the latter from Japan, Amurland, and Corea, I find that the insects are separable on well-defined and constant characters. I had not previously recognized *japonica*, Butler, as the spring form of *bianor* and had accepted *tutannus*, Fenton, as a form of *dehaani*. There is, however, now no doubt in my mind that the two insects last named respectively represent *maacki* and *bianor* in Japan.

The majority of the specimens of this species occurring in Japan during the summer are referable to var. *tutannus*, but I have male examples from Yesso which agree exactly with the male of *maacki* from Amurland figured by Ménétrics. Although not exactly identical, the Japanese spring specimens do not exhibit any marked differences from var. *raddei*, a small spring form of *maacki* occurring in Amurland.

I am not certain whether typical *P. maacki* occurs in any other part of Japan than Yesso; but it is quite probable that it may be found in the mountains of the main island. Pryer's remarks are so brief that nothing can be gathered from them, and he does not give the locality of the specimen he figured, which is certainly var. *tutannus*.

Fixsen (Rom. sur Léop. iii. p. 254) records both *maacki* and *raddei* from Corea.

Staudinger states that he has typical *maacki* from North China.

Graeser obtained larvæ of both broods of *P. maacki* in Amurland. He states that they were found feeding on *Phellodendron*, and that some of the pupæ of the summer brood remain in that state through the winter, and of the imagines resulting from these hibernated pupæ, one of the female examples measured 90 millim., but with all the other characters of var. *raddei*.

Pryer gives as the larval food "*Ægale sepiaria* and other kinds of orange-trees."

Distribution. Amurland, Japan, Corea, and N. China.

Papilio dialis. (Plate XXXII. fig. 4, ♂.)

Papilio dialis, Leech, Entomologist, xxvi., Suppl. p. 104 (1893).

Male. Closely resembles *P. bianor*, but there is no patch of silky hairs between the first median nervule and the submedian nervure, and the patches on the veins are composed of shorter hairs. The primaries are black, sprinkled with bronzy-green scales, except on the venation and broad rays between the nervules. Secondaries black, thickly powdered with greenish scales, those on the costal half and on the tails being bluish, and those on other portions of the wing bronzy; there is a broad annular mark at anal angle, a lunule in first median interspace, and another in discoidal interspace—all these marks are red dashed with lilacine on their upper edges. Under surface of primaries pale grey, merging into white on the outer two-thirds of inner marginal area: all the nervules and streaks between them are broadly black, and there are four nerve-like black streaks in the discoidal cell: secondaries velvety black, sprinkled on the basal and abdominal areas and on the tails with metallic-green scales; there is a series of seven red irregular-shaped lunules on the outer margin, the sixth is united with the seventh by a broad projection from the lower edge of the latter, and its upper extremity almost unites with the lower end of the fifth lunule.

Expanse 130 millim.

One example taken at Chia-ting-fu in July.

This species is most readily distinguished from *P. bianor*, *P. maacki*, &c., by the different arrangement of the silky sexual brands on the primaries of the male.

Papilio syfanius. (Plate XXXII. fig. 5, ♂ var.)

Papilio syfanius, Oberthür, Etud. d'Ent. xi. p. 13, pl. i. fig. 3 (1886).

"Le *Papilio syfanius* a été découvert à Ta-Tsien-Loù, par Mgr. Felix Biet. Je ne connais encore que le mâle. Il est voisin de *bianor* et de *dehaanii* dont il diffère par la forme plus rétrécie de ses ailes inférieures, par l'absence de toute tache bleuâtre vers la partie supérieure de ses ailes inférieures en dessus, par le manque de toute éclaircie blanchâtre le long du bord extérieur de ses ailes supérieures en dessous, par la présence au contraire d'une éclaircie

blanchâtre sur le disque de ses ailes inférieures en dessous, alors que cette partie des ailes est précisément la plus obscure dans les espèces voisines." (*Oberthür, l. c.*)

Female. Primaries rather paler than those of the male, and without the patches of long silky-black hairs, but similar to that sex in all other characters.

Expanse, ♂ 108-120 millim., ♀ 118-130 millim.

This species is only separable from *P. lianor* by its narrower secondaries, the entire absence of bluish colour on the costal area, and the presence of a more or less well-defined pale patch on the disc of these wings. On the under surface the outer area of primaries is not paler than the rest of the wing.

In his description of *P. syfanius*, M. Oberthür refers to a whitish patch on the under surface of secondaries, but this is not represented in his figure of the species. This patch, which is placed at the end of the discoidal cell and is separated into three portions by the discoidal and upper discocellular nervules, is present in all the specimens of the species that I have seen. Sometimes it is white and conspicuous, but frequently it is suffused with fuscous and more rarely with greenish. In some of the specimens with well-defined white patches the interspaces above the patch are very pale, as in the example figured (Plate XXXII. fig. 5).

Occurs at Ta-chien-lu, Wa-shan, Pu-tsu-fong, Chia-kon-ho, and Ni-ton in Western China during June and July, at elevations ranging from 5000 to 9000 feet.

Papilio arcturus.

Papilio arcturus, Westwood, Arc. Ent. i. p. 101, pl. xxvii. (1812).

"*P. alis nigris, viridi-atomosis* : posticis obtuse dentatis et late caudatis ; anticis striga interrupta macularum ex atomis viridibus formata, ex angulo postico ad partem dimidiam alarum ducta et eum margine subparallela ; posticis supra, plaga magnitudine mediocri, versus angulum externum late cærulea strigae ejusdem coloris ex ejus apicem ad marginem alarum extensa, lunalis tribus sanguineis, maculaque ocellari (medio nigro) et linea transversa sanguineis ad angulum analem, illa eum striga curvata viridi-atomosa coronata ; alis subtus nigricantibus basi albido-atomosis, anticis striga lata subapicali cinerea, venis lineisque intermediis nigris ; posticis lunalis 5 rubro-fulvis (cæruleo-pulverosis) maculisque duabus magnis rubro-fulvis (medio nigris et lunula supra cærulea ornatis) ad angulum analem.

"Expans. alar. antic. unc. 5.

"Inhabits the Himalayan Mountains, Sylhet, and the adjacent parts of India." (*Westwood, l. c.*)

I have received this species from Ichang, Central China, and from Moupin, Omei-shan, Wa-shan, and Chia-kou-ho in Western China. The specimens vary considerably in size, and probably represent two broods.

Elwes (Trans. Ent. Soc. Lond. 1888, p. 427) states that *P. arcturus* is found in Sikkim from May to August, at elevations of from 3000 to 9000 feet. It occasionally settles on the forest-paths; the female is rather larger than the male, but does not differ from it in other respects.

Papilio krishna.

Papilio krishna, Moore, Horsfield & Moore, Cat. Lep. Mus. E. I. C. p. 108, pl. ii. a. fig. 6 (1857).

“Upperside black, irrorated with golden-green atoms; fore wing with a well-defined transverse fascia of deep golden-green atoms from anterior margin, commencing at one third of the length of the wing from the apex to posterior margin near the angle; hind wing with a brilliant sky-blue sinuated patch near anterior angle, and connected with abdominal margin by a broad well-defined sinuous line of deep golden-green atoms; near the margin is a series of five crimson lunules, margined inwardly by a purplish-blue line, the one on the abdominal margin inclosing at the anal angle a black spot, which is bounded at the angle with ferruginous; the space between the sinuous line and patch and the lunules is pure black, without irrorations; the space from the lunules and down middle of tail with golden-green irrorations; indentations margined with white, and tinged inwardly with ferruginous. Underside black; both pairs of wings basally irrorated with golden-green and whitish atoms; fascia of fore wing creamy white; hind wing with creamy-white fascia from anterior margin near angle to middle of the wing, then branching upwards to abdominal margin; lunules seven in number, brighter and broader than on upperside; the indentations and anal angle with broad, pale, ferruginous lunules.” (*Moore, l. c.*)

Two male specimens of this species were taken in June at Wa-shan, in Western China, at an elevation of 6000 feet. Except that the transverse bands on upper surface of primaries and on all the wings beneath are less well defined, these Chinese examples do not differ from Sikkim specimens.

In his “Catalogue of the Lepidoptera of Sikkim” (Trans. Ent. Soc. Lond. 1888, p. 427) Mr. Elwes says of *P. krishna*:—“A common species in some seasons at certain places, and found from 3 up to 8 or 9000 feet, but hard to catch in good condition. I have seen it most often on or about the bare tops of hills, like Sinchul, which are clothed with dense chestnut, oak, and magnolia forest, in which it probably lives and breeds, and comes out on sunny mornings into the openings, where alone it can be taken. The female is extremely rare, only one or two specimens being known to us. Its season is from May to August.”

This and the preceding five species are probably referable to the genus *Sarbaria*, Moore (Proc. Zool. Soc. 1882, p. 258).

Papilio paris.

Papilio paris, Linnaeus, Syst. Nat. i. 2, p. 745 (1767); Drury, Ill. Exot. Ent. i. pl. xii. figs. 1, 2 (1773); Donovan, Ins. China, pl. xxii. (1798); Gray, Cat. Lep. Brit. Mus. i. p. 17 (1852).

Achillides paris, Hübner, Verz. bek. Schmett. p. 85; Gray, loc. cit.

Male. Black, thickly sprinkled with green scales except on the veins. Primaries traversed by a yellowish-green band, not always clearly defined towards costa. Secondaries have a large blue patch beyond discoidal cell, the inner edge of this patch is curved and invades the cell, and the outer edge is sinuous; on abdominal margin above anal angle there is a reddish and violet ring, often interrupted; the space between these two marks is only sparingly powdered with green, and is limited by yellowish-green irregular bands; the costal area above and the outer marginal area beyond blue patch is also clear of green scales. Fringes black, chequered with white between the nervules, narrowly on primaries, but more broadly on secondaries. Under surface: basal half of primaries black, as also is the outer marginal area, the intervening space is whitish grey, tapering towards inner margin, and intersected by the black nervules and internervular streaks; secondaries black, basal half sprinkled with greyish scales; sub-marginal crescents reddish and violet.

Female rather browner than the male, and the blue patch on secondaries is of less extent and deeper in tint.

Expanse, ♂ 98-130 millim., ♀ 117-130 millim.

The blue patch varies in tint and is sometimes rather greenish than blue.

This species has been placed in *Harimala* by Wood-Mason and de Nicéville.

An exceedingly common species in Western China. Specimens vary considerably in size, the smaller examples being probably referable to a spring brood.

Referring to this species in Sikkim, Mr. Elwes (T. E. S. 1888) says:—"The commonest of the green Papilios in the low valleys, and taken up to 5000 feet. Settles on flower-heads and the damp sand in river-beds, and flies rapidly up and down their banks. The female is seldom taken, but does not differ from the male, except in its paler coloration."

Distribution. India and China.

Papilio gyas. (Plate XXXII. fig. 1, ♂ var.)

Papilio gyas, Westwood, Arc. Ent. i. p. 41, pl. xi. (1812).

Papilio hercules, Blanchard, Comptes Rendus, lxxii. p. 809 (note) (1871).

Papilio sciron, Lecch, Entomologist, xxiii. p. 192 (1890).

Debasa gyas, Moore, Dec. New Ind. Ins. p. 283 (1888).

"*P. alis* anticis subhamatis, posticis caudatis; supra fuscis, margine obscuriore luteo submaculatis, macula parva caerulea ad angulum ani; subtus brunneis, medio pallidis lunulisque subargenteis notatis.

"Expans. alar. unc. 4 $\frac{3}{4}$. Habitat Assam.

- “The wings above are of a dull brown colour, the anterior having a dark brown triangular spot about the middle, extending across the discoidal cell, at the extremity of which is a second similar spot; the outer margin is darker, with six luteous submarginal patches; between the apex of the wing and the extremity of the discoidal cell are three indistinct oval patches of a similar colour. The hind wings are similarly coloured, but the margin is darker brown and wider, and the luteous spots assume the appearance of indistinct lunules; at the angle is a small patch of blue scales. The body above is clothed with greenish hairs; on the underside the colours are much brighter and more varied. The base is occupied by a large space of rich dark red-brown or maroon, of which there is also a patch at the extremity of the discoidal cell. This is succeeded by a bar of whitish fleshy-coloured tint which passes gradually to brown and purple: near the apex of the fore wings is a large patch of pale opaline colour, from which extends a bar of fulvous brown, terminating above in white angles preceded by purplish and obscure brown arches, the margin is brown, within which is an obscure bar of luteous. The extremity of the discoidal cell in the hind wings is occupied by a dark brown patch preceded by a white opaline arch edged with black; a bar of the former colour extends also to the anal angle, and adjoining the tail are several luteous spots preceded by opaline-white lunules; the space between them and the discoidal cell being rich dark brown. The whole underside has a glossy appearance. The body beneath is brown, the abdomen yellowish. The legs are red-brown. The specimen represented is a male.
- “The species is most nearly allied to *P. peranthus*.” (*Westwood, l. c.*)

Var. **hercules**, Blanchard = **sciron**, Leech. (Plate XXXII. fig. 1, ♂.) “Ayant le corps très-robuste, l'aspect des espèces du genre *Charaxes*, les ailes d'un brun foncé, traversées par une bande d'un fauve pâle et par une série de taches marginales de même nuance, les ailes postérieures pourvues d'un prolongement caudal de médiocre longueur, fauve avec une ligne médiane noire.” (*Blanchard, l. c.*)

Male. Velvety brownish black, base of primaries sprinkled with yellowish scales, markings of all the wings bright orange-yellow: those on primaries comprise a broad central fascia, a blotch on costa at the extremity of cell, a central row of four spots, and a submarginal series of spots: the secondaries have a central fascia and submarginal row of spots, margins of anal angle tinged with chestnut, and above it is a short streak of bluish-grey scales. Under surface: basal third of all the wings rich chocolate-brown, central third yellowish white, and outer third fuscous with paler interrupted submarginal band; there is a patch of chocolate-brown at the extremity of the discoidal cell on all the wings, and one at anal angle of secondaries.

Female. Agrees with male, but the markings are rather paler.

Expanse, ♂ 102 millim., ♀ 116 millim.

The Chinese form of *P. gyas*, described as *P. hercules* by Blanchard, and as *P. sciron* by myself, differs principally from the type in having a broad fulvous fascia on all the wings.

It occurs in Western China at Chia-kou-ho in July, Huang-mu-chang in August, and at Omei-shan and Moupin.

Elwes (F. E. S. 1888, p. 437) referring to *P. gyas*, says:—“this is a decidedly rare species in Sikkim. I have seen it once only flying round the top of a

hill at 6000 feet at Rikisum in August. Möller has seen it on Birch Hill at 7000 feet in July, and Mr. Knivett has taken the very rare female on Sinchul in August. It seems, therefore, to be a single-brooded species, inhabiting the same zone of elevation as most of the peculiar Sikkim species do. The female, which has never been described, differs very markedly from the male in its pale whitish colour above."

Distribution. Sikkim and Western China.

Papilio philoxenus.

Papilio philoxenus, Gray, Zool. Misc. p. 32 (1831); Lep. Nepal, pl. ii. (1846); Westwood, Cab. Orient. Ent. p. 81, pl. xl. fig. 2 (1848).

Papilio polyuctes, Doubleday, Zool. Misc. p. 74 (1842); Westwood, l. c. pl. xl. fig. 3.

Papilio lama, Oberthür, Etud. d'Entom. ii. p. 15, pl. iii. fig. 1, ♀ (1876).

Byasa philoxenus, Moore, Proc. Zool. Soc. Lond. 1882, p. 258.

"*Papilio* alis anticis maris nigris, feminae fuscis nigro longitudinaliter striatis, posticis elongatis caudatis, valde sinuatis, macula magna oblonga alba versus angulum externum, puncto vel macula minori utrinque interdum adjecta, lunulis tribus rufis vel albo-rufis maculaque rufa ad apicem caudae strigaeque in pagina infera, ex angulo anali rufis.

"*Papilio*, with the fore wings of the male black, the female brown with black longitudinal streaks between the veins, the hind wings more or less elongated, tailed, and deeply sinuated, with a large white spot near the outer angle, occasionally with a smaller spot on either side of it, and with three red or red and white lunules, a red spot at the extremity of the tail, and with a variable streak of red extending inwardly from the anal angle on the underside of hind wings.

"Expansion of the fore wings $4\frac{1}{2}$ to $5\frac{1}{2}$ inches.

"Inhabits Assam, Sylhet, Nepal, &c.

"Figure 2, which is drawn from the type specimen of *P. philoxenus*, has the tail but moderately broad, and the spots on the upperside of the hind wings are (except the large outer one) strongly marked with red. This is a native of Nepal.

"Figure 3 represents another insect from Sylhet, which Mr. E. Doubleday (Zool. Misc. p. 74) described under the name of *P. polyuctes*, but which he now considers as a variety only of *P. philoxenus*. The posterior wings are very much elongated, and on the upperside the large white spot of the hind wings is not accompanied by the two small spots visible on either side of it on the under surface, nor is the red mark at the anal angle visible. Mr. Doubleday having represented the upperside of this supposed species in his work on the butterflies now in course of publication, the underside is here given, copied from a figure communicated by Mr. Doubleday." (Westwood, l. c.)

Var. *polyuctes*, Doubleday. "Male. Above: anterior wings black, deepest at base, striated in the discoidal cell and between the terminations of the nervures; posterior wings very much elongate, deeply dentate, with a rather spatulate tail; between the two posterior branches of the subcostal nervure, and close to the discoidal cell, is a large nearly quadrate white spot; at

the anal angle is a broad sigmoid spot, crimson where it touches the margin, dusky red internally; a second spot of a dusky red is placed at the termination of the tooth, between the tail and the anal angle; preceding this, and nearly in front of the tail, is an oval spot, and near the outer margin, opposite the tooth preceding the tail, a larger quadrate one, both of the same dusky red; tail marked at the apex with a rounded crimson spot, slightly shaded with fuscous, and divided by the nervure. Below: anterior wings rather paler than above; striae more distinct: posterior wings nearly as above, the red markings much brighter, the white patch preceded by a small rounded dot of the same colour, and followed by a white dash margined with pink: on the abdominal margin, above the sigmoid spot, is a narrow bifid crimson spot.

"*Head* crimson: thorax and abdomen very hairy black above, crimson below, the former marked anteriorly above with crimson, the latter with the incisures below black; legs black. (Exp. alar. 4 unc. 9 lin.)

"Inhabits Sikket. Museo H. Doubleday." (*Doubleday, l. c.*)

Var. **lama**, Oberthür. "Les ailes supérieures du *Papilio lama* sont semblables à celles des autres espèces de ce groupe. Elles sont d'un brun obscur, mais un peu transparent, avec un léger reflet, et un peu moins foncées dans la femelle que dans le mâle. Les nervures sont marquées en noir vif, et l'espace compris entre les nervures est traversé par un trait noir commençant régulièrement et parallèlement aux dites nervures, un peu en dehors de la cellule discoïdale, pour aller aboutir à la frange. La cellule discoïdale elle-même est intérieurement marquée de quatre de ces traits, qui sont réunis à la base et montent en s'épanouissant vers le sommet de la cellule. Cette disposition des ailes supérieures est du reste commune à un très-grand nombre de *Papilio* de continent asiatique et de l'Archipel indien.

"Par les ailes inférieures seules, le *P. lama* présente des différences avec les autres espèces ou variétés de *P. latreillei*. Les ailes inférieures de *lama* sont absolument dépourvues de cette large tache d'un blanc jaunâtre, quelquefois simple, d'autres fois double ou triple, ou en bande maculaire, qu'on remarque dans *philoxenus* et ses variétés, *latreillei*, etc., etc.

"Les ailes inférieures de *lama*, dans le mâle comme dans la femelle, ont une série de quatre taches principales, dont les trois premières, à partir de l'angle anal, rouges, saupoudrées de brun foncé, et la dernière plus blanchâtre, aussi un peu rebrunie par un semis noir et rosé. Ces taches, placées entre les nervures, le long du bord extérieur de l'aile, sont au milieu d'une macule triangulaire noire, à reflet bleuâtre, qui, montant du bord extérieur de l'aile, se rétrécit en pointe vers la cellule discoïdale.

"À l'extrémité de la spatule de la queue est une tache rouge, divisée par la nervure; cette tache manque quelquefois dans les mâles.

"Les mâles ont au bord abdominal des ailes une poche cotonneuse brune; les femelles ont à cette place un simple renflement de l'aile.

"En dessous, le thorax et l'abdomen sont marqués de rouge carmin; le collier est également rouge. Aux palpes, les poils sont rouges avec l'extrémité noire." (*Oberthür, l. c.*)

This species, which is exceedingly common in Central and Western China at moderate elevations, is excessively variable in the markings of secondaries. As I received a very large number of specimens from China I was able to select an extensive and very variable series which, including my Himalayan examples, comprises over fifty specimens.

In one of the Chinese specimens the secondaries are entirely black on the upper surface, and the submarginal markings on the under surface are but very faintly indicated, whilst an example of the same form, taken in Kulu, N.W. Himalayas, is entirely without markings on either surface of the wings. From this form the size and number of the submarginal lunules gradually increase, and the red spot towards extremity of the tail becomes visible. The red lunules and white spots increase in size by degrees until the characteristics of var. *lama* are reached, of which form a female example is figured by Oberthür; continued gradation leads up to the typical form of *philoxenus*, and beyond this to an extreme form in which the red markings are very pronounced, some of them confluent, and the white quadrate spot very large with a smaller white spot above and below it.

In addition to the variation referred to in the above remarks, *P. philoxenus* is subject to still other modifications. In some examples all the spots on secondaries are red; in others, although the submarginal lunules are well defined, the spot on the tail is absent. In some specimens there is an extra red patch above anal angle, and in others this is represented by a white blotch which is sometimes broken up into two or three spots. The white quadrate spot, which is usually present, is excessively variable in shape, being in some specimens nearly circular; in others it is triangular, and in others, again, bar-shaped, often contracted in the middle, and sometimes separated into two spots; in a few specimens this mark is hook-shaped.

A common insect throughout the Himalayas. Elwes states that in Sikkim it is met with up to an elevation of 8000 feet from April to November.

Distribution. Central and Western China*; the Himalayas, Siam, Upper Burmah.

Papilio alcinous.

Papilio alcinous, Klug, Neue Schmett. p. 1, pl. i. figs. 1-4 (1836).

Papilio alcinous, var., Gray, Cat. Lep. Ins. B. M. i. p. 12, pl. iv. figs. 2, 3 (1852).

Papilio menicus, Felder, Wien. ent. Mon. vi. p. 22 (1862).

Papilio spathatus, Butler, Ann. & Mag. Nat. Hist. (5) vii. p. 139 (1881).

Papilio hæmatostictus, Butler, *loc. cit.*

* Oberthür (Etud. d'Entom. xi.) records a variety of *P. maria*, Semper, from Kouy-Tchéou. I am not acquainted with Semper's species, which is from the Philippines, but I am inclined to think that Oberthür's insect is referable to *P. philoxenus*.

- "Alis posticis sinuato-dentatis spathulato-caudatis, fusco cinereis, abdomine subtus lunulisque quinque ad marginem posticum alarum posticarum ochraceis." (*Klug, l. c.*)
- Var. **mencius**, Felder = *P. alcinous*, var., Gray. "Variety. Male (pl. iv. fig. 3). The primary wings brownish black glossed with purple, having streaks of darker colour between the nervules and the discoidal cell. The secondary wings brownish black, having the base glossed with purple, with four lunæ along the outer margin of a red colour with scattered black scales.
- "The under surface of the primary wings is pale brownish black, with streaks of darker colour between the nervules and in the discoidal cell. The under surface of the secondary wings is deep brownish black, with five rosy-red lunæ along the outer margin; and at the anal angle there is an abbreviated broad band of rosy red which is paler in part.
- "Female (pl. iv. fig. 2). 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 lunæ 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 upperside. The under surface of the secondary wings is entirely black, more or less with a velvety appearance; six rosy-red lunæ are placed along the outer margin, and at the anal angle there is a large spot of the same colour.
- "In Collection (Brit. Mus.) from Northern China.
- "It is called 'Chentih' by the Chinese." (*Gray, l. c.*)
- "Alis nigricantibus, posticis caudis longis, per totam longitudinem æquilatis, maculis submarginalibus erythrinis, in pagina superiore quatuor obsoletioribus, in pagina inferiore quinque lunaformibus, in femina dimidio basali late olivaceo-fusco.
- "In collibus prope Ningpo. Geographica mutatio *P. alcinôi*, Klug, japonici, ejus typica specimina e Museo Leydensi et Berolinensi ante nos habemus; differt non solum colore et formatione lunularum in alis posticis, sed etiam alis magis elongatis ideoque angustioribus et caudis ad basin vix attenuatis. Cel. Gray utrumque sexum l. c. optima figura expressit." (*Felder, l. c.*)
- Var. **spathatus**, Butler. "Possibly a seasonal form of *P. alcinous*; the latter species, however, was not obtained in Nippon by Mr. Maries; he obtained shattered males and a single fine female in Yesso; it is therefore more probable that this is a local representative of *P. alcinous*. It differs in its considerably greater size, much longer and more spatulate tails, in the heavier black borders and veins on the female, in the much obscured red submarginal lunules on the upper surface of the male secondaries, and the broader and dingier submarginal curved spots on the female secondaries. Expanse of wings, male, 4 inches 1 line; female, 4 inches 10 lines.
- "This is a commoner species than *P. alcinous*, which (owing to the fact that Klug erroneously figures its female as that sex of his species) it generally represents in collections. *P. alcinous*, female, agrees with the male in size and form." (*Butler, l. c.*)

Var. *hematostictus*, Butler. "In Yesso Mr. Maries caught the female of a species which in 1862 we received the male of from Hakodate. It is allied to *P. meniscus* of Felder (males of which Mr. Maries obtained at Kiukiang, China); but the wings are darker, the tails on the secondaries are more slender, the submarginal lunules are absent from the upper male secondaries, and are less arcuate and smaller upon the upper surface of the female. To this species I give the name of *P. hematostictus*." (Butler, l. c.)

This is one of the commonest Papilios occurring in the region dealt with in the present work; there are several broods in the more southern districts.

The species is exceedingly variable both in size and shape as well as in colour and marking, and several of the forms have been named and described. The males range from 84–114 millim. in expanse, and the females from 90–116 millim. The tails are subject to considerable modification both as regards breadth and length, and they may be either spatulate or of almost uniform width throughout. Some male specimens are entirely without red lunules on upper surface of secondaries, whilst others have five or even six well-formed and conspicuous lunular marks; the gradations between these extremes are represented in my series. In several specimens of both sexes, taken by myself in the island of Kiusiu, the lunules are yellow instead of red. The female appears to be constant in Japan, but not in the Loochoo Islands, where it varies in shade of ground-colour. The palest females are from Southern Japan (*alcinous*), and are light fawn in colour with yellow lunules; whilst the darkest, which are almost black, are from Central China.

Pryer, who states that the larva which feeds on *Cocculus thunbergii* "resembles a partially ripe mulberry, and the pupa is beautifully sculptured," says of the imago:—"The male emits a peculiarly sweet, musky odour when alive. The female also emits a fainter odour, but to me this is as unpleasant as that of the male is pleasant."

Distribution. Western and Central China, Corea, Japan, and Loochoo Islands.

Papilio plutonius.

Papilio plutonius, Oberthür, Etud. d'Entom. ii. p. 16, pl. iii. fig. 2 (1876).

"Les ailes supérieures du mâle sont d'un noir un peu transparent avec les nervures marquées en noir et des traits noirs longitudinaux compris entre ces nervures, absolument comme dans les espèces du groupe de *polyeuctes*, *philozenus*, et celles du groupe d'*alcinous*, *meniscus*, entre lesquelles le *Papilio plutonius* forme une remarquable transition.

"Les ailes inférieures sont noires, glacées d'un reflet cuivreux, avec la poche anale brune et cotonneuse; elles sont assez profondément découpées, ont une queue courte et spatulée, et sont

ornées de taches rouges semées de noir. Ces taches, situées dans l'entre-deux des nervures et près du bord extérieur, sont lunulées; celle qui est plus près de l'angle anal est plus chargée de rouge; les deux suivantes sont encore assez rouges; mais les trois dernières paraissent rouges presque uniquement par la transparence du dessous. Ces lunules sont au milieu d'une macule triangulaire qui ressort plus noire sur le fond de l'aile.

"Le dessous reproduit le dessus, mais est d'un ton plus pâle et plus mat. Les taches rouges de l'aile inférieure ne sont pas saupoudrées de noir, et il y a en plus de celles du dessus une grosse tache rouge près de la poche anale; cette tache transparait cependant un peu en dessus.

"La femelle diffère du mâle parce que la poche est remplacée par un renflement et parce que la couleur des ailes est d'un brun plus pâle, cuivreux, au lieu d'être noir." (*Oberthür, l. c.*)

This species seems to combine the characters of both *P. alcinous* and some of the aberrant forms of *P. philoxenus*. From *P. alcinous* it may be separated by the greenish-cupreous sheen of the upper surface of the male and in both sexes by the more irregular outline of the secondaries and more spatulate tails; the under surface of all the wings is olivaceous brown, thus causing the venuration of secondaries to appear more prominent. The female more nearly resembles the same sex of *P. alcinous*.

In both sexes the secondaries have the appearance of being semitransparent, and this will serve to at once separate *P. plutonius* from any form of *P. alcinous*.

From dark forms of *P. philoxenus* this species can easily be separated by the number and arrangement of submarginal lunules on the under surface of the secondaries; these in *P. plutonius* are seven in number, instead of five, and are placed in a regular series nearer to the margin of the wing than in *P. philoxenus*; there is never any trace of a red spot on the tail or on the lobe at end of second median nervule, and the spot beyond discoidal cell is not white.

Although the red submarginal lunules are always constant on the under surface they vary in definition on the upper surface, and in one example are reduced in number to one spot at anal angle.

Appears to be common and generally distributed in Western China.

In his "Catalogue of the Lepidoptera of Sikkim" (Trans. Ent. Soc. Lond. 1888), Mr. Elwes, referring to *P. plutonius*, says:—

"Of this species I have only two females in bad condition, brought by my native shikaris from the interior, perhaps from Bhotan, in 1884. They strongly resemble small dark females of the Japanese *P. alcinous* in all but their shorter spatulate tails, and are probably the females of a western form of this species."

Distribution. Western China, Bhotan.

Papilio nevilli.

Papilio nevilli, Wood-Mason, Ann. & Mag. Nat. Hist. (5) ix. p. 105 (1882).

Papilio (Panaosmia) nevilli, Wood-Mason & de Nicéville, Journ. Asiat. Soc. Beng. Iv. pt. ii. p. 374, pl. xv. figs. 2, 2 ♂ (1886).

Papilio cheatsong, Oberthür, Etud. d'Ent. xi. p. 13, pl. i. fig. 1 (1886).

"Posterior wings above with two large pink-white spots, one between the discoidal vein and the second branch of the subcostal, occupying all but the two ends of the space; the other in the space next in front, smaller, and not extending so far towards the base of the space, and with three bright crimson submarginal lunules, two subequal in the interspaces between the branches of the median vein, and the third between the third median veinlet and the discoidal vein, equal to, or slightly greater than, the other two taken together; below with a small pink-white spot between the first branch of the subcostal and the costal veins, forming with the two visible on both sides of the organs a series of three, all equally distant from the outer margin; the submarginal lunules larger and subequal and much lighter coloured, and with a fourth rather irregular-shaped crimson spot, subequal to the lunules, and divided into two unequal parts by the first median vein, at the end of the basal half of which it is placed, with the tails well-developed but not constricted at base." (*Wood-Mason, l. c.*)

Silchar, Cachar.

Var. **cheatsong**, Oberthür. "Je pense que le *Papilio cheatsong* dont Mgr. Bict nous a envoyé deux très beaux mâles pris à Yerkafo, est une forme géographique de *ravana* dont il diffère par le rétrécissement des taches blanches et rosées de ses ailes inférieures en dessus, la coloration plus vive des taches roses des mêmes ailes en dessous et principalement par la forme de ses queues qui sont plus droites, plus allongées, à peine spatulées et non marquées de rouge, comme dans *ravana*." (*Oberthür, l. c.*)

The figure of *cheatsong*, Oberthür, only appears to differ from that of *nevilli*, Wood-Mason and de Nicéville, in the smaller size of the two pale blotches on the costal portion of the outer area of the secondaries.

I have received a very large number of specimens of this species from Western China, where it was found in most of the localities visited by my collectors. As in the allied species, the submarginal spots of secondaries are liable to considerable variation, not only in size and shape, but also in number and coloration. In some specimens the upper spots, which are usually white, are well marked with red, whilst in other specimens the only spots present are the three upper ones, which are greatly reduced in size and are pure white in colour. In most of my specimens the red spot towards anal angle is absent or only slightly indicated, none of them exhibit any trace of a red spot towards extremity of the tail which seems to be always present in *P. ravana*, Moore, of which, however, it cannot be considered a local race, as M. Oberthür suggests it may be.

Distribution. Cachar and Western China.

Papilio memnon.

Papilio memnon, Linnaeus, Syst. Nat. i. 2, p. 747 (1767).

Papilio agenor, Linnaeus, l. c.; Distant, Rhop. Malay. p. 339, pl. xxix. fig. 1, ♀ (1885).

Papilio memnon, Pryer, Rhop. Nihon. p. 4, pl. ii. fig. 1 (1886).

Papilio androgeos, Cramer, Pap. Exot. i. pl. xci. figs. A, B (1776).

Papilio thunbergii, Siebold, Hist. Nat. Jap. p. 16 (1824).

Iliades memnon, Hübnér, Verz. bek. Schmett. p. 88 (1816); Moore, Lep. Ceyl. i. p. 147 (1881).

“*P. E. alis dentatis nigris; omniibus basi subtus rubro notatis.* (*Mus. Lud. Utr.* 193.)

“Habitat in China.

“*Alæ primores subtus basi macula ovata, rubra; posticæ basi paribus 4, subrotundis, rubris, confertis.*” (*Linnaeus, l. c.*)

Papilio agenor, Linnaeus.—“*P. E. alis dentatis nigris basi sanguineis; primoribus striatis; posticis disco albo maculis nigris.* (*Mus. Lud. Utr.* 194; *Clerck, Ic. t. xv.*)

“Habitat in China.

“*Alæ primores concolores, albo late striata. Posticæ atræ disco albo; posticæ cinctæ maculis 7 nigris, versus anum rubro insectis. Similis æcipha.*” (*Linnaeus, l. c.*)

Papilio thunbergii, Siebold.—“*Alis fuscis anterioribus supra basi triangulo sanguineo, posterioribus subdentatis, subtus basi maculis quatuor sanguineis (raro).*” (*Siebold, l. c.*)

Males of *P. memnon*, which are always more abundant than the females, are far more constant in colour and markings. Usually they are without the red basal patch on upper surface of primaries, but sometimes this is well developed.

In Japan the species seems to be confined to the southern island of Kiushiu, where I met with it fairly plentifully both at Nagasaki and in the province of Satsuma in the month of May. The males agree very well with Distant's figure of the same sex of *P. esperi*, Butler (Rhop. Malay. pl. xxviii. fig. 1), but the reddish lunules on under surface of secondaries are not quite so conspicuous, and are entirely absent in some specimens. They also agree in some respects with *P. ciliæ*, Distant (*l. c.* pl. xxix. fig. 4). The females have rather more white on the secondaries, and the red spots of under surface are not so large as in the female of *P. ciliæ*.

From Western China I have only one specimen, a female, which was captured in Kwei-chow. It agrees very well with the same sex of *P. agenor*, Linnaeus, as figured by Distant (*l. c.* pl. xxix. fig. 1).

I received male specimens of *P. memnon* from Chang-yang, Central China, and captured others at Hong-Kong, Foochau, and Ningpo.

In the Loochoo Islands, where this species appears to be common, there is a large pale form of the female closely approaching *agenor*; this form is figured by Pryer, who was apparently unacquainted with the true Japanese female. The males from the same locality agree with Cramer's figure of *P. androgeos*.

In his paper on the Lepidoptera of Sikkim, Mr. Elwes (Trans. Ent. Soc. Lond. 1888, p. 428) states that "*P. androgeos* is common in the lower valleys and found as high as 4000 or 5000 feet from April until December. The common form of female in Sikkim is tailed, with a considerable amount of white in and beyond the cell of the hind wing; but tailless females are also found without any white markings, and others with a broad white patch on the hinder margin of the fore wing."

Distribution. China, Japan, Loochoo Islands, Continental India, Malay Peninsula, Sumatra, and Borneo.

Papilio protenor.

Papilio protenor, Cramer, Pap. Exot. i. pl. xlix. figs. A, B (1779).

Papilio laomedon, Jones; Fabricius (nec Cramer), Ent. Syst. iii. 1, p. 12 (1793);

Donovan, Ins. China (Westwood ed.), p. 56, pl. 27, ♀ (1812).

Sainia protenor, Moore, Proc. Zool. Soc. Lond. 1882, p. 260.

"Le dessus des ailes antérieures de ce Papillon Chinois est d'un lustre bleu obscur. Quelques petits grains bleus célestes sont dispersés sur les postérieures, vers leur bord extérieur. Il a six pieds; selon la division systématique de Linnæus on peut le ranger parmi les Chevaliers Troyens." (*Cramer, l. c.*)

Outer margin of secondaries dentated, but not prolonged into a tail.

Male. Primaries dark bluish grey, with the venation black, broad, velvety; black streaks between the nervules and in discoidal cell. Secondaries velvety bluish black, the costal and outer areas sometimes sprinkled with pale blue scales; there is a black anal spot more or less completely encircled with reddish, the latter colour edged on the outer margin with white. Under surface: primaries whitish grey; the basal area suffused with blackish; venation and black streaks as above; secondaries velvety black; there are some reddish lunules on the costal half of outer margin; the black spot at anal angle is placed in a large irregular-shaped patch, which is dusted with pale lilac scales and is sometimes connected with a reddish ring near outer margin in the first median interspace.

Female. Upper surface similar to that of the male, but the primaries are sometimes brownish in colour; the reddish marks at anal angle and in first median interspace agree with those on under surface of the male; on the under surface the reddish patches are large and diffuse, and there are five lunules on outer marginal area.

Expanse, ♂ 96-142 millim., ♀ 156 millim.

The males are fairly constant in colour and marking, and the females

exhibit parallel variation to that observed in the same sex of *P. demetrius*.

This is perhaps the commonest species of *Papilio* inhabiting Central and Western China; it was found in numbers in all places visited by my collectors. Mr. Elwes states that it occurs in Formosa and at Hong-Kong, and adds that it has been recorded by Felder from Ningpo. I took specimens at Foochau in April. Motschulsky erroneously enumerates it from Japan.

In India *P. protenor* is found throughout the Himalayas, up to an elevation of 6000 feet, from April to October.

Papilio demetrius.

Papilio demetrius, Cramer, Pap. Exot. iv. p. 196, pl. cccxxxv. figs. E, F (1782); Pryer, Rhop. Nihon. p. 4, pl. iii. fig. 1 (1886).

Papilio carpenteri, Butler, Ann. & Mag. Nat. Hist. (5) x. p. 318 (1882).

« Ce Papillon ressemble au *P. protenor* de la Chine, mais il en varie par les queues en forme de spatules aux ailes inférieures, par le défaut des pointilles azurées; comme aussi par le dessin varié des taches rouges en forme de demi-lune sur le dessous des ailes susmentionnées. Mr. M. Houttuin, a reçu ce Papillon, avec plusieurs autres insectes, du Japon, il me l'a prêté pour le faire dessiner. » (Cramer, l. c.)

Papilio carpenteri, Butler.—*Male*. « Primaries above blackish grey, with borders, veins, and internervular streaks black; secondaries greenish black; a large jet-black spot at anal angle, bordered above by an orange-red lunule enclosing a black dash, and sprinkled in front with a few pearly-whitish scales, below by a triangular golden-orange spot; fringe white between the veins; the usual sulphur-yellow costal streak; body black; abdomen greenish. Primaries below ash-grey, the black streaks and veins narrower than above; secondaries greenish black; a decreasing submarginal series of four orange lunules from apex to lower radial interspace; a few scales in the second median interspace, a large crescent in the first median interspace, and a large irregular patch enclosing a black spot, sprinkled in front with white scales, and bordered with white on the margin at anal angle; body below black. Expanse of wings 118 millim.

« ♀. Tateyama Bay, entrance to Gulf of Yedo. » (Butler, l. c.)

The *female* is usually larger than the male, and is rather broader in the wing; the primaries are paler, and the disc of secondaries is usually suffused with bluish scales; the red patch at anal angle is well defined, as also are the red submarginal lunules.

This species is very common in the neighbourhood of Nagasaki and throughout the Island of Kiushiu during the spring, but the specimens are smaller in size than those which appear later in the year. The females, which are very much scarcer than the males, exhibit considerable variation in the red submarginal markings of secondaries.

Pryer (*l. c.*) states that in Japan the imago is common from April to the

end of the summer, and that the larva feeds on *Ægle sepiaria*. According to de l'Orza the larva is found on orange-trees.

Mr. Elwes, referring to this species (Proc. Zool. Soc. Lond. 1881, p. 872), remarks that he and Mr. Godman possess specimens taken by W. B. Pryer in the Fungwhan Hills, near Ningpo; the only Chinese locality from which I have received specimens is Kiukiang.

There is very little to separate *P. demetrius* from *P. protenor*, excepting that the latter is without tails—a character which in some species of *Papilio* is of but little importance.

Distribution. Japan; Central and Eastern China.

Papilio macilentus.

Papilio macilentus, Janson, Cist. Entom. ii. p. 158 (1877); Pryer, Rhop. Nihon. p. 4, pl. iii. fig. 2 (1886).

Papilio scævola, Oberthür, Etud. d'Entom. iv. p. 37, pl. vi. fig. 1 (1879).

Papilio tractipennis, Butler, Ann. & Mag. Nat. Hist. (5) vii. p. 139 (1881).

“Allied to *P. demetrius*, Cram., but with all the wings narrower and much more elongated; primaries above dusky black, the black streaks between the nervures very narrow; secondaries with the outer margin strongly notched, the tails long and narrow, black, costa pale yellow, four small indistinct spots along the outer margin, and a broad ring on the abdominal margin dull red; beneath the primaries are paler than in *demetrius* and somewhat shining; secondaries with four lunular spots along the outer margin, an interrupted ring on the abdominal margin, and a spot near the anal angle pale red. Expanse of wings $3\frac{3}{4}$ – $4\frac{1}{4}$ lines.

“The very long slender wings are sufficient to distinguish this species at once from *P. demetrius*, Cram., the only species which resembles it in other respects; it appears to be confined to the mountains, and has been taken by Messrs. Pryer and Jonas on Oyama.” (*Janson, l. c.*)

Papilio scævola, Oberthür.—“Remplace quelque part le *demetrius* du Japon; diffère de celui-ci par une taille plus petite et la forme de ses ailes inférieures fortement dentées, étroites, allongées, avec la queue longue et paraissant peu recourbée intérieurement.” (*Oberthür, l. c.*)

Papilio tractipennis, Butler.—“*Male*. Intermediate in size between *P. macilentus* and *P. demetrius*; similar to the latter, from which it differs in its greater size, its more elongated wings, longer and broader tails, also in the greyer tints of the primaries, upon which the black outer border appears more prominently; below the primaries are distinctly paler and greyer, the markings upon the secondaries are brighter in colour, redder, and there is an abbreviated additional red fasciole, bounded below by an arcuate streak of blue scales, across the first median interspace. Expanse of wings 5 inches 2 lines.

“*Female*. This is the *P. demetrius* of Gray (nec Cramer); but when fresh this sex is nearly as dark as the male, although browner in tint, and with two ocellated and several submarginal lunate red markings on the upper surface of the secondaries; as usual, it is broader in wing than the male, and the tails are shorter. Expanse of wings 5 inches. Nikko.” (*Butler, l. c.*)

I have specimens from the Island of Kiushiu. According to Pryer this

species is rare about Yokohama, but is more abundant in the mountains; it occurs from May throughout the summer. He says:—"The female is very seldom to be obtained. The male, which is ornamented exactly as in the preceding species [*P. demetrius*], is in its first brood often very diminutive, and I have captured them less than half the size of the female specimen figured. I have not yet found the larva. This species is specially adapted to fertilizing lilies, the pollen from the flowers, which it frequently visits, adhering to its long hind wings and tails."

The male specimens in my collection range from 86-120 millim. in expanse, and the largest female measures 134 millim.

This insect does not appear to be common in China. I have received specimens from Kiukiang, Ta-chien-lu, Wa-ssu-kow, and Pu-tsu-fong. Oberthür's type of *sewola* was from Boisduval's collection, and probably from China.

Dr. Staudinger curiously confounds this species with *P. machaon*.

Distribution. Central China; Southern and Central Japan.

Papilio helenus.

Papilio helenus, Linnaeus, Syst. Nat. i. 2, p. 745 (1767); Distant, Rhop. Malay. p. 343, pl. xxix. fig. 3, ♂ (1885); Pryer, Rhop. Nihon. p. 4, pl. ii. fig. 2 (1886).

Papilio nicconicolens, Butler, Ann. & Mag. Nat. Hist. (5) vii. p. 139 (1881).

Charus helenus, Moore, Lep. Ceyl. i. p. 149, pl. lviii. fig. 3, ♂ (1881).

"*P. E. alis caudatis nigris; posticis macula alba; subtus tribus albidis lunulis septem ferrugineis.*" (*Linnaeus, l. c.*)

"Brownish black. Fore wing sparsely irrorated with golden-yellow scales disposed in streaks between the veins. Hind wing with a broad pale yellow upper discal band, which has an irregular outer border; an indistinct crimson slender lunule above anal angle, and other lunules from the lower exterior margin, these being most distinct in the female; a few yellow scales on the disc below the band.

"Expanse $4\frac{1}{2}$ to $5\frac{1}{2}$ inches.

"Larva green, similar in form to *P. parinda*, with pale pinkish flesh-colour lateral lower band along all the segments, the oblique band on the eighth, ninth, and tenth segments more irregular and extending across the back. Pupa olive-brown, much curved backward anteriorly, similar to that of *P. parinda*." (*Moore, l. c.*)

Papilio nicconicolens, Butler.—"Very near to *P. helenus*, but constantly differing in the creamy-yellow patch of secondaries being carried below the radial vein in the form of a large squamose spot, and in the submarginal lunules on the under surface of the same wings being far more arcuate. Expanse of wings 5 inches 3 lines." (*Butler, l. c.*)

The differences on which *nicconicolens* has been separated as a species

from *P. heleanus* are not of the slightest importance, and do not serve to separate Japanese specimens from Chinese or Indian examples. The form to which Butler has given the fantastical name of *nicronicoleus* was said to have been received from Nikko. Pryer, however, states that he never met with this insect in the main island of Japan, but only in the south. I found the species commonly at Nagasaki and in the province of Higo and Satsuma in May; I also met with it at Hong-Kong, Foochau, and Ningpo. In Central and Western China it appears to be a rare species, and I have only received it from Ichang and Omei-shan.

Mr. Elwes (Trans. Ent. Soc. 1888, p. 429) states that *P. heleanus* is one of the commonest species of *Papilio* in Sikkim and occurs at all elevations up to 6000 feet, but is most numerous in the low valleys from April to October.

A widely ranging species, occurring in many parts of India; also in Ceylon, Malay Peninsula, Penang, Perak, Malacca, Java, Borneo, Philippines, Celebes, Cachar, China, and Japan.

Papilio rhetenor.

Papilio rhetenor, Westwood, Arc. Ent. i. p. 59, pl. xvi. figs. 1, 1 a, ♂ (1812).

Papilio icarius, Westwood, Cab. Orient. Ent. p. 5, pl. ii. ♀ (1848).

Papilio (*Panosmiopsis*, subg. nov.) *rhetenor*, Wood-Mason & de Nicéville, Journ. Asiat. Soc. Beng. 1886, p. 374.

"Alis supra nigro-cyaneo nitidis, posticis oculo incompleto ad angulum ani albo supra rufo: subtus anticis griseis nigro striatis, basi sanguineis; posticis aterrimis margine omni anali late sanguineo nigro maculato angulo ani albo irrorato. Expans. alar. unc. 5½."

"This fine species is a native of Assam. On the upperside the wings are of a black colour, tinged with very dark blue, especially towards the outer angle of the hind wings, being there increased by a number of minute, slender, elongated, blue scales. At the anal angle is an incomplete eye, formed of a black spot, partially surrounded on the inside with a whitish crescent, the upper part of which is tinged with sanguineous. The fore wings beneath are of a grey colour, darker towards the base and along the outer edge, with the veins and intermediate longitudinal fasciæ black, the base being blood-red, which colour extends broadly along the whole of the anal margin of the hind wings (except in the anal fold), marked with a black spot at the anal angle, which is much irrorated with white. The sanguineous colour in the next area of the wing is marked with three black spots, the middle one being the largest. The head and neck above are spotted with dirty white, and the antennæ and legs are black. The abdomen is wanting in the unique specimen now before me.

"Most nearly allied to the Chinese *P. proteenor*, but differs in the anal eye, in the extent of the sanguineous colour along the whole anal margin of the hind wings, and in wanting the spots along the hind margin of the same wings." (*Westwood, l. c.*)

The female, described by Westwood under the name *icarius*, differs from the male in having the

ground-colour paler and the red streak in discoidal cell of primaries broader and darker. Secondaries have a short broad tail, the anal ocellus is larger, and there is a submarginal series of red lunules and a marginal series of red spots; beyond the cell there is a pale cloud. Under surface as in the male, but the red submarginal markings are broader, those towards anal angle forming complete oval ocelli; the pale cloud on disc is more conspicuous than above.

In Chinese specimens there is always a broad red streak at the base of discoidal cell of primaries; the anal ocellus is well defined, and in some specimens the outer angle of primaries is suffused with greyish scales. On the under surface of secondaries there is sometimes a complete series of red submarginal lunules and usually a bluish cloud at outer angle. In one example there are three red spots on outer margin and in the first median interspace, remnants of the complete ocellus seen in the female.

This species does not appear to be common in China. I have only received it from Chang-yang and Ichang, Central China, and from Chia-ting-fu in Western China. The only female that I have was taken at the last-named locality.

Referring to the occurrence of *P. rhetenor* in Sikkim, Mr. Elwes says:—“Found not uncommonly in the lower valleys, and up to 5000 or 6000 feet, from April to October. Two forms of the male exist, which I am not able to separate except by the colour of the hind margin of the fore wing, which in one form is more or less overlaid with grey or white scales close to the angle. There is also some variation in the white lunules which are present at the abdominal angle of the hind wing, and in some specimens show more or less on the upper surface. The female form described as *icarius* is, without doubt, the female of this species. It is rare in Sikkim.” (*Elwes, Trans. Ent. Soc. Lond.* 1888, p. 428.)

Distribution. Himalayas, Central and Western China.

Papilio elwesi.

Papilio elwesi, Leech, *Trans. Ent. Soc. Lond.* 1889, p. 113, pl. vii. fig. 1.

Male. Ground-colour of all the wings black. Primaries and anterior portion of secondaries thickly sprinkled with whitish scales on each side of the nervures and nervules, which gives the insect a grey and streaked appearance. Posterior portion of secondaries black with a bluish tinge, ornamented with five deep red crescent-shaped marks and an ocellus; the latter is bordered with white on its external edge, and is situated at the anal angle. Along the outer margin are four small red marks, bordered externally with white, that situated between the extremities of the first and second median nervules being much the largest. Under surface:

colour and ornamentation similar to these characters on the upperside, but somewhat fainter. Head, thorax, and legs black. Body bluish black.

Female. The primaries are rather darker, there are a few bluish scales below the centre of the secondaries, the tails are slightly more rounded, and the red marginal markings of the under surface of secondaries are more pronounced.

Expanse 156 millim.

This species can at once be separated from any other known *Papilio* by its broad spatulate tails, which are traversed to their margins by *two* (the 2nd and 3rd median) nervules.

The original specimens were from Kiu-kiang. I have since received examples from Chang-yang in which the discoidal cell of secondaries is filled in with white intersected by black vein-like streaks, the white extending beyond the cell in the form of a triangular spot.

I am indebted to Mr. John Watson of Manchester for the loan of a drawing of a female specimen from Central China. Mr. Grose Smith has also kindly lent me for examination two examples of this sex of *P. elwesi* which he received from Ichang.

Papilio bootes.

Papilio bootes, Westwood, Arc. Ent. i. p. 123, pl. 31 (1842).

"*P. alis nigris, valde elongatis, posticis spathulato-caudatis, harum disco plaga media alba, vena nigra in duas partes divisa, macula ad angulum ani, lunulisque tribus submarginalibus rufis: incisuribus pallide marginatis, caudaque bimaculata; alis subtus similibus at pallidioribus: omnibus plaga magna basali rufa; maculis lunulisque rufis majoribus, capite, collo et corpore infra rufo.* Expans. alar. unc. 5.

"Inhabits Sylhet in the East Indies." (*Westwood, l. c.*)

Male. Fuliginous black, generally marked with red at the base of the primaries; neurion of all the wings, streaks between the veins and in discoidal cell of primaries, black. The secondaries have the outer margin deeply excavated between the nervules, the tail is short and spatulate; there is generally a large white central patch divided by the third median nervule, sometimes a smaller one below in the first median interspace and a still smaller one in the submedian interspace; the red markings comprise a spot at anal angle surmounted by a lunule, a lunule in first median interspace and four lunules on outer margin. Under surface paler than above; all the wings are marked with red at the base, the white central spot rather larger, all the red lunules on outer margin are surmounted by others, and that in the submedian interspace is sometimes united with the lunule in the next interspace by a red streak along the first median nervule. Head and collar marked with red. Abdomen black above, red beneath.

Female. Subdiaphanous, fuliginous grey, markings as in the male.

Expanse, ♂ 116-123 millim., ♀ 124-126 millim.

The white spots on the central area of secondaries vary considerably in size

and number in both sexes. In some specimens there are but the faintest possible traces of them, and in others they are entirely obliterated. In one example of the female there are two white central elongate marks suffused with the ground-colour and marked with reddish on their outer extremity, below them is a reddish spot. None of the Chinese examples have any red spot on the tail.

My collectors met with this species at Moupin, Wa-ssu-kow, and Ni-ton, in Western China.

Papilio polytes.

Papilio polytes, Linnaeus, Syst. Nat. i. 2. p. 746 (1767); Clerck, Icones, pl. xiv. fig. 1 (1861); Cramer, Pap. Exot. iii. pl. cclxv. figs. A-C (1782); Distant, Rhop. Malay. p. 347, pl. xxxiii. figs. 7 ♂, 8, 9, 10 ♀ (1885).

Papilio pannon, Linnaeus, Syst. Nat. i. 2. p. 746 (1767); Clerck, Icones, pl. xiv. fig. 2 (1764); Cramer, Pap. Exot. ii. pl. cxli. fig. B (1779).

Papilio pannon, var. *borealis*, Felder, Wien. ent. Mon. vi. p. 22 (1861).

Papilio romulus, Cramer, Pap. Exot. i. pl. xliii. fig. A, ♀ (1776).

Laertius romulus, Moore, Lep. Ceyl. i. p. 150, pl. lix. figs. 1 a-c (1881).

Papilio pannon, var. *thibetanus*, Oberthür, Etud. d'Entom. xi. p. 14 (1886).

- “*Male*. Wings above blackish or very dark fuscous; anterior wings with an outer marginal series of small creamy spots placed between the nervules; posterior wings with a transverse discal series of large creamy spots divided by the nervules, the fringe alternately creamy and blackish. Wings beneath as above, but the posterior wings having a submarginal series of lunulate ochraceous spots, two spots a little above anal angle, the uppermost largest, reddish, and preceded by some bluish scales, the fringe-like spots much larger than above. Body and legs more or less concolorous with wings.
- “*Female*. Varietal form A.—Closely resembling the male above, but with a red spot at a little above anal angle of posterior wings; wings beneath as in male, but the reddish spot above anal angle of posterior wings duplex, and preceded by a somewhat reddish spot thickly irrorated with bluish scales situate between the second and third median nervules.
- “Varietal form B.—Anterior wings above much paler, the basal area darker and with darker streaks in cell and between the nervules; posterior wings with five creamy discal spots, one in and near end of cell and four beyond apex of cell divided by the discoidal and first and second median nervules, the innermost spot being more or less ochraceous and situate in a larger reddish patch irrorated with violaceous scales which extends to abdominal margin, and being divided by the lower median nervule; a submarginal series of reddish lunulate spots placed between the nervules, the two within the area of the caudate appendage duplex, and a large reddish spot near anal angle with a blackish centre, the fringe alternately creamy and blackish. Anterior wings beneath much paler than above; posterior wings as above, but with the submarginal spots larger and irrorated with bluish scales and the fringe-like spots also larger than above.” (*Distant, l. c.*)

This is the commonest form of the female both in the Malay Peninsula and China.

- Var. **borealis**, Felder. "Alis maris spathulato-caudatis, maculis minutis marginalibus albidocetraceis, posticis utrinque fascia albo-sulphurea, maculis abbreviatis, bene distantibus formata lunulisque marginalibus angustissimis ochraceo-albis, sultus maculis parvis externis albo-ochraceis, lunula anali fulva maculisque duabus atomariis caeruleis supra eam.
- "Ning-po. Magnitudine fere specimina Indae et Chinae meridionalis geographica haec varietas superat. Mas maculis discalibus multo magis separatis, dimidio fere minoribus lunulisque marginis angustissimis distinguitur. Femina (formae *polytes*, Linn.) nisi lunulis exterioribus alarum posticarum a margine magis remotis a juvenibus speciminibus haud recedit. Aberrationem ejus recepinus sat insignem. Alae posticae enim in pagina superiore tres tantum maculas albas sat abbreviatas gerunt, quarum prima inter ramum subcostalem secundum et venam discoidalem sita fere punctiformis, tertia autem macula minute rubescenti, annexa est. Reliquae inferiores minores sunt et omnino rubeseunt. Inter venam costalem et ramum subcostalem secundum maculae duae vix angustate brunneae conspiciuntur, macularum albarum obsoleta quasi continuatio. Item macula alba punctiformis in brunneum colorem transit." (Felder, l. c.)

This form only differs from male *polytes* in being larger, and in having the band on secondaries formed of smaller spots. The female of this form agrees very well with the same sex of *polytes* as figured by Cramer (*l. c.*).

M. Oberthür (*l. c.*) refers to a variety of this species from Chapa and describes it as follows:—

- Var. **thibetanus**. "Les taches blanc jaunâtre du disque des ailes inférieures sont extrêmement rétrécies et partiellement oblitérées; de plus, on voit le long du bord extérieur des ailes inférieures une rangée intranervurale de croissants fauves, qui se termine par une grosse tache anale de même nuance; j'ai désigné cette variété, dont le faciès est tout à fait différent du type, sous le nom de *thibetanus*."

Distant, in his 'Rhopalocera Malayana,' gives two figures of the varietal form A of the female; I have examples of both sexes from China which agree with his figure 9. Some male specimens from Omei-shan are very interesting, because they have red submarginal lunules on the secondaries, characters which are generally found only in the female of this species. I have a female example from Foochau which is an exact counterpart of these males, and a similar specimen of the female is figured in Moore's 'Lepidoptera of Ceylon,' pl. lix, fig. 1 a, under the name *Laertias romulus*.

In Southern China I captured typical males, and also females exactly corresponding with them in colour and marking. In Northern and Western China the var. *borealis* appears to be the dominant form, but is subject to

modification; thus, in the males, the spots forming the central band are sometimes exceedingly small and vary in colour from the palest yellow to ochreous, there is often a red anal lunule, and in some specimens there are red submarginal lunules. The female of the *borealis*-form varies in the number, shape, and size of the central yellowish spots.

L. polytes is common in all parts of China which my collectors visited. It has been recorded from Japan, but I believe that this is an error. Pryer does not mention it, although he was well acquainted with the species as he received a large number of specimens from the Loochoo islands. I found the insect plentifully in gardens at Foochau and I also met with it at Ningpo.

Elwes says that it is common in Sikkim, at low elevations.

Polytes and *pammon* are treated as distinct species by Horsfield and Moore in their Catalogue of Lepidoptera in the Museum of the East India Company, where the larva and pupa are figured (plate iii. figs. 3, 3 a, 4, 4 a). The larva is stated to feed "on a species of *Citrus*, bearing the native name of *Juruk*." Lemon tree and common lime have also been given as food-plants.

Mr. de Nicéville (Journ. Asiat. Soc. Beng. 1885, p. 52) says:—"the commonest *Papilio* in Calcutta. All three forms of the female occur. Larva reared on *Glycosmis pentaphylla*, *Ægle marmelos*, and the common lime."

Distribution. India, Ceylon, Perak, Malay Peninsula, Java, Borneo, Philippines, Siam, Cochin China, Loochoo, and China.

I captured *Papilio erithonius*, Cramer, at Foochau, early in April; but so far it does not appear to have been met with in any part of the region dealt with in the present work.

Papilio aristolochiæ.

Papilio aristolochiæ, Fabricius, Syst. Ent. p. 443 (1775); Distant, Rhop. Malay. p. 337, pl. xxxi. figs. 6, 7, vars. (1885).

Papilio polidorus, Cramer, Pap. Exot. ii. p. 45, pl. cxviii. (1777).

Papilio diphilus, Esper, Ausl. Schm. pl. xl. b. fig. 1 (1785-1798).

Menelaus aristolochiæ, Moore, Proc. Zool. Soc. Lond. 1882, p. 259.

"*Male.* Anterior wings above fuliginous, the basal area blackish, and the remaining area streaked with blackish, both in cell and between the nervules; posterior wings blackish, with five whitish spots beyond cell, the first and smallest situate above the discoidal nervule, the fifth between the lower median nervule and the submedian nervure, and a submarginal row of six

reddish spots placed between the nervules, of which the upper three are the most obscure; a red spot above anal angle more or less fused with the inner whitish spot. Anterior wings beneath as above, but paler; posterior wings with the red spots larger and brighter than above, and with a small additional whitish spot within and just before end of cell (this spot is frequently visible above). Head and pronotum black, with an anterior pronotal collar and a tuft between the eyes carmine-red. Abdomen red, spotted above and beneath with black; thorax beneath and legs black; lateral margins of the thorax at base of wings carmine-red.

“*Female*. Resembling the male, but the anterior wings broader, and the red submarginal spots to the posterior wings rather more obscure.

“Exp. wings, ♂ ♀, 70 to 90 millim.” (*Distant, l. c.*)

The larva and pupa of *P. diphilus*, Esper, are figured by Horsfield and Moore (Cat. Lep. Mus. E. I. C. pl. ii. figs. 5, 5 a). Distant states that *P. aristolochiæ* is a variable species, and that there are no constant differences between the type and var. *diphilus*.

The description given above seems to apply very well to Chinese examples; these do not, however, exhibit much variation, excepting in the prominence of the red submarginal lunules of secondaries and the size and number of the white discal spots.

The species seems to be widely distributed. I met with it commonly near Foochan, in April 1886. Mr. W. B. Pryer records it from Ningpo. My collectors met with it commonly at Kiukiang, and I also received it from Chang-yang, Central China, and from Huang-mu-chang, Western China.

It occurs in most parts of India and in Burma, Malay Peninsula, Penang, Malacca, Siam, and Java.

Papilio epycides.

Papilio epycides, Hewitson, Exot. Butt. ii. (*Pap.*) pl. vi. fig. 16 (1864).

Papilio horatius, Blanchard, Comptes Rendus, lxxii. p. 809, note (1871).

“*Upperside*. Male dark brown. The discoidal cell of the anterior wing grey; the posterior wing with the cell white; both traversed longitudinally by two lines of black, one of which is bifurcate: both wings traversed longitudinally between the nervures by grey-white, followed closely by a transverse band of white spots, and on the posterior wing by a second submarginal band of similar white spots, the anal spot large and orange; the abdomen with four rows of white spots.

“*Underside* as above, except that it is paler, that the anterior wing is traversed at the apex by rays of white, and that the costal margin of the posterior wing is broadly rufous brown.

“*Expan.* $3\frac{2}{9}$ inch. Hab. North India.

“In the Collection of W. C. Hewitson.

“This species has been known to me for several years, but until I had an opportunity of examining several specimens I was unwilling to describe it. It is nearly allied to *P. agestor*, but

differs from it in the colour and form of the posterior wing, and has besides an orange spot at its anal angle. The abdomen is *spotted* with white, not banded as in *P. agestor*." (*Hawitson, l. c.*)

Var. **horatius**, Blanchard. "Ayant le port d'une Danaïde et une certaine parenté avec les *Papilio agestor* et *acnacles*, les ailes d'un noir terne, parsemées d'écailles d'un blanc-jaunâtre, formant de larges raies; les ailes postérieures arrondies, ornées d'une tache fauve à l'angle interne." (*Blanchard, l. c.*)

Occurs in Western China at Moupin, Omei-shan, and Chow-pin-sa. The specimens differ from Darjiling examples in being more suffused with black. Both sexes are represented, but excepting that the females are rather larger and darker and more rounded in the wing, they do not differ from the males in general appearance.

This species bears a strong superficial resemblance to dark females of *Pareba vesta*, which is very common in Western China.

Mr. Elwes (Trans. Ent. Soc. Lond. 1888, p. 432) says that *P. epycides* "occurs not uncommonly in some seasons at 2000 to 3000 ft. in April and May. The female is unknown to me, but is described by Möller as like the male, but with broader wings, and all the white markings comparatively larger. This species seems to have been found nowhere but in Sikkim, and is said by Möller to frequent the sandy beds of streams, like other species of the genus, and to be single-brooded."

Oberthür (Etud. d'Entom. iv. p. 100) records *Papilio dissimilis* from China, but does not give the exact locality.

Papilio agestor. (Plate XXXV. fig. 5, var. ♀.)

Papilio agestor, Gray, Zool. Misc. p. 32 (1831); Lep. Ins. Nep. p. 6, pl. iv. fig. 2 (1846); Westwood, Arc. Ent. i. pl. xvi. fig. 2 (1842).

Cadugoides agestor, Moore, Proc. Zool. Soc. Lond. 1882, p. 260.

"*P. alis* griseis, venis margineque exteriore nigris, griseo punctatis; posticis corticinis, disco punctato griseis. Expansio alarum, 3½ unc. Habitat in Sumatra." (*Gray, Z. M.*)

"Fore-wings grey, with the veins and the margin black, the latter spotted with grey; the hind wings brownish red, with the disc and spots grey. Under surface similar to the upper, but paler.

"Expansion of wings 3-3¼ inches." (*Gray, L. I. N.*)

This species is represented in China by a distinct form, for which I propose the name

Var. *restricta*, var. nov. (Plate XXXV. fig. 5. ♀.) Reddish-brown coloration of secondaries brighter and restricted to a triangular-shaped patch on the anal area of these wings; the streaks in discoidal cell of primaries are more pronounced, and those in cell of secondaries are black instead of reddish.

Appears to be a scarce species in China, as I have only received two specimens (♂ ♀); these were captured at Chang-yang. Except that the female is rather larger and rounder in the wing, the sexes are alike.

Elwes (Trans. Ent. Soc. Lond. 1888, p. 431) considers that *P. gopala*, Moore, and *P. goindra*, Moore, are probably forms of *P. agestor*, Gray, and states that it is rare in Sikkim, occurring in May at from 6000 to 7000 feet. Its range extends into Bhotan and the N.W. Himalayas.

Fam. HESPERIIDÆ.

Genus CALLIANA.

Calliana, Moore, Proc. Zool. Soc. Lond. 1878, p. 686; Watson, Proc. Zool. Soc. Lond. 1893, p. 31.

"Wings ample, broad. Fore wing trigonal; cell long, broad: costal vein extending to one third from apex; subcostal vein curved at end of the cell, first, second, third, and fourth branches arising at equal distances before end of the cell, fifth from its end, the three former terminating before the apex, fourth at the apex, and fifth below it; discocellulars angled close to the upper end; upper radial from the angle, lower from their middle; median vein three-branched, widely apart, the upper from lower end of cell, middle and lower branches at equal distances, the lower from near base of cell; submedian slightly recurved. Hind wing broadly ovate; subcostal two-branched, second before end of cell; discocellulars slightly angled; radial from their angle; median three-branched, middle branch from immediately before end of cell. Body small, robust; abdomen short. Palpi short, thick, pilose, ascending; third joint short, conical. Antennæ slender. Legs pilose.

"Type *pieridoides*." (Moore, l.c.)

Calliana pieridoides. (Plate XXXIX. fig. 8, ♂.)

Calliana pieridoides, Moore, Proc. Zool. Soc. Lond. 1878, p. 687, pl. xlv. fig. 2.

"*Male*. Upperside creamy white, glossy; fore wing with the apex broadly vinous brown, the ends of the median veins also with a vinous-brown-speckled spot; hind wing with a curved upper discal decreasing series of five purple-black spots, the upper one large and situated between the costal and subcostal veins; the end of the veins also with a small vinous-brown-speckled spot. Underside white; fore wing with the costal base, a patch beyond the end of the cell, and the outer border pale vinous brown; hind wing with a short black narrow streak at end of costal border, four large subbasal and a curved discal series of seven purple-black spots, a

marginal series of broad vinous-brown spots, one at end of each vein. Thorax and abdomen white; collar, top of head, palpi, and tip of abdomen pale ferruginous; tip of palpi and antennæ black; legs pale ferruginous above, purple-brown beneath.

“Expanse 2½ inches.” (*Moore, l. c.*)

One male specimen was taken by a native collector at Pu-tsu-fong, Western China, in July. It differs only from the Bengalese type in Mr. Moore’s collection in having a rather deeper apical border to primaries; the spots at ends of median nervules are larger; the discal spots on secondaries are very faint, except that between the costal and subcostal veins.

The colour of apical border and also of the spots is rather blackish than vinous brown, as mentioned by Moore in his description of *C. pieridoides*.

Mr. Doherty*, who obtained male specimens near Margherita, Assam, says:—“They fly in the darkest parts of the forest towards the end of the afternoon, alighting, like the other butterflies of the *Tagiades* group, with outspread wings. In the morning they lie concealed, adhering closely to the underside of leaves. No one who sees it floating lazily with level wings up and down the bed of a stream, its pure white upper surface singularly conspicuous in the gloom of the jungle, can doubt that the species is protected. I see no reason to suppose that it mimics any Pierid. In a very vague way it resembles the Geometrid genus *Euchera*, which is likewise protected, and has somewhat similar habits.

“The entire body and wings of this butterfly are saturated with a powerful and delicious odour of mingled vanilla and heliotrope. This is often perceptible as it flies past. After pinching the insect, the scent is sometimes obvious for hours afterwards on one’s fingers. After lying two weeks in its paper, a dried specimen still gave out perfume. None of the sweet-smelling Lepidoptera known to me, not even the *Lethes*, *Euploas*, or *Callidulas*, have a more powerful odour. Yet it seems to have no specialized scent-organ (such as those genera have), unless the tufts on the hind tibiae, present in many other Hesperians, be so considered.

“I unluckily caught no female, though I once saw a male circling round a dark-coloured Hesperian, which escaped. It is, perhaps, rash to speculate where certainty may before long be attained, but the female is most likely dark.”

* Journ. Asiat. Soc. Beng. 1889, p. 133.

Genus PISOLA.

Pisola, Moore, Proc. Zool. Soc. Lond. 1835, p. 785; Watson, Proc. Zool. Soc. Lond. 1893, p. 31.

- “Palpi large, erect, projecting beyond the head, densely pilose; third joint minute, conical. Antennæ rather long, curved backward at the apex. Body very stout; abdomen extending to within one third of the length of the hind wing. Legs moderately slender; femora pilose beneath; mid tibiæ armed with a pair, and hind tibiæ with two pairs, of slender apical spurs. Wings large, broad; costa of fore wing slightly arched; exterior margin oblique; posterior margin straight. Hind wing convex at the base of anterior margin; apex, exterior margin, and anal angle convex. Subcostal vein of fore wing six-branched; second and third arising at equal distances from the first; fourth to sixth contiguous at their base to the third.” (*Moore, l. c.*)

***Pisola zennara*.**

Pisola zennara, Moore, Proc. Zool. Soc. Lond. 1865, p. 786, pl. xlii. fig. 4.

- “*Male and female*. Upperside brown; fore wing with a broad yellowish-white semitransparent irregular margined discal band obliquely from middle of costa to posterior angle; hind wing, in the male, exteriorly with two greyish longitudinal streaks between each vein, these being absent in the female. Abdomen with pale greyish anal tuft. Underside uniform brown, with oblique discal band as above. Front of head and palpi dull orange-yellow. Body and legs brown. Cilia brown.
- “Expense, ♂ $2\frac{1}{2}$, ♀ $3\frac{1}{2}$ inches. N.E. Bengal.” (*Moore, l. c.*)

Mr. Grose Smith has one female example of this species from Omei-shan, Western China.

- Elwes (Trans. Ent. Soc. Lond. 1888, p. 442) states that *P. zennara* is rare in Sikkim, and occurs between April and August in low valleys. He adds, “the antennæ of the female are much less hooked than those of the male.”

Genus ACHALARUS.

Achalarus, Seudder, Syst. Rev. Am. Butt. p. 50 (1872). Type, *lycidus*, Smith-Abb.

Achalarus, Seudder, Butt. East. Un. States, vol. ii. p. 1112 (1889); Watson, Proc. Zool. Soc. Lond. 1893, p. 33.

Lobocta, Moore, Journ. Asiat. Soc. Beng. vol. liii. pt. 2, p. 51 (1884). Type, *liliana*, Atkinson.

- “Antennæ: club moderate, bent into a hook, the terminal portion about as long as rest of club. Palpi perfect, second joint densely scaled, third joint short. Fore wing: inner and outer margins subequal; vein 12 reaching costa before end of cell; male with a costal fold; cell long, more than two thirds length of costa; upper discocellular minute, middle and lower discocellulars inwardly oblique in the same straight line, the lower the longer; veinlet at vein 4; vein 3 more than four times as far from base of wing as from end of cell; vein 2

about three times as far from end of cell as from base of wing. Hind wing slightly lobed at anal angle; discocellulars faint, erect; vein 5 present, but very faint; vein 7 three times as far from 8 as from 6; vein 3 just before end of cell; vein 2 almost twice as far from base of wing as from end of cell. Hind tibiae with two pairs of spurs.

"American and Asian." (*Watson, l. c.*)

Achalarus bifasciatus. (Plate XXXVIII. fig. 9, var.)

Eudamus bifasciatus, Bremer & Grey, Sehmelt, N. China's, p. 10, pl. iii. fig. 1 (1853);

Oberthür, Etud. d'Entom. xi. pl. vi. fig. 47 (1886).

Goniloba bifasciatus, Ménétrics, Mus. Petr. Lep. i. pl. v. fig. 3 (1855).

Plesioneura bifasciata, Elwes, Proc. Zool. Soc. Lond. 1881, p. 910.

"Alis supra: fuscis, albo-fimbriatis; anticis guttis hyalinis quinque, punctis apicalibus hyalinis tribus, bifasciatis; subtus: fuscis, cinereo-fasciatis et nebulosis.

"Expans. alar. antic. unc. 1½." (*Bremer & Grey, l. c.*)

The above description refers to the male, which sex is very much the commonest. The female is rather larger than the male, and has the wings rounder; the spots forming the central band are rather larger, especially that on the costa, which is usually quadrate.

Var. **contractus**, var. nov. (Plate XXXVIII. fig. 9, ♂.) Rather greyer in colour; the spots forming the central fascia are narrower and differently shaped, those towards apex are often minute.

This form appears constant, and has so far only been met with at Wa-ssu-kow and Wa-shan in Western China, in which localities the type form does not seem to occur.

I met with it commonly about fifteen miles from Gensan at the foot of the mountains; Fixsen also records it from Corea. In Western China it occurs at Ni-tou, Moupin, Chow-pin-sa, Pu-tsu-fong, Wa-shan (var. *contractus*), and Wa-ssu-kow (var. *contractus*). I have also received it from Chang-yang and Kiukiang in Central China and from Ningpo.

Achalarus proximus. (Plate XXXVIII. fig. 7, ♂.)

Eudamus proximus, Leech, Entomologist, xxiv., Suppl. p. 59 (June 1891).

Eudamus frater, Oberthür, Etud. d'Entom. xv. p. 18, pl. i. fig. 3 (July nec June, 1891).

Mal. Closely allied to *A. nequus*, Oberthür, but can be easily separated by the ground-colour, which is very dark shining brown, instead of being tinged with olive; the wings are rounder, and the outer margins of secondaries are not so indented; the position of the two apical spots is also different. The colouring of the under surface more nearly resembles that of *A. germanus*, Oberth., but the apical spots of primaries and the position of the dark bands on secondaries at once distinguish it from that species.

Expans. 4.5 millim.

“Voisin de *bifasciatus*, *germannus*, *nepos*, etc.; mais bien distinct par le rétrécissement des taches vitreuses aux ailes supérieures. Le dessous des ailes inférieures ressemble plus à *germannus* qu'aux autres espèces, c'est-à-dire que les taches noir violacé sont également foncées chez *germannus* et chez *frater*; mais leur position relative est différente, comme aussi la position des taches vitreuses aux supérieures.” (*Oberthür, l. c.*)

I received this species from Pu-tsu-fong in Western China, where it was captured in June, and M. Oberthür records it from Yunnan.

Achalarus germanus.

Eudamus germanus, Oberthür, Etud. d'Entom. xi. pl. vi. fig. 48 (1886).

Very similar to *A. bifasciatus*, var. *contractus*, on the upper surface, but four of the five subapical spots are contiguous and arranged in an oblique line. On the under surface of secondaries the ill-defined bands of *bifasciatus* are replaced in *germannus* by series of conspicuous dark irregular-shaped marks, one of which, the third of submarginal series, is cuneiform.

M. Oberthür does not describe this species, of which he received four examples from Ta-chien-lu. I have specimens from Pu-tsu-fong and Wa-ssu-kow, where they were captured in June and July at an elevation of about 8000 feet in the former locality, and at 5000 feet in the latter.

Achalarus nepos.

Eudamus nepos, Oberthür, Etud. d'Entom. xi. pl. vi. fig. 49 (1886).

Both sexes agree in general characters with *A. bifasciatus*, var. *contractus*, but the primaries are dusted with greyish; the secondaries are greyish on the disc, broadly bordered with blackish on outer margin; the third spot of central series on primaries is placed farther apart and appears to connect the five apical spots with the fourth of central series. On the under surface all the wings are greyish, and the bands of secondaries are composed of more or less dark quadrate spots, agreeing somewhat in this respect with *A. germanus*, but the third of submarginal series is not triangular.

M. Oberthür received two specimens from Ta-chien-lu, and I have three males and one female from Pu-tsu-fong taken at an elevation of about 8000 feet in July.

Achalarus simplex. (Plate XXXVIII. fig. 12, ♂.)

Eudamus simplex, Leech, Entomologist, xxiv., Suppl. p. 58 (June 1891).

Eudamus gener, Oberthür, Etud. d'Entom. xv. p. 18, pl. i. fig. 2 (July nec June, 1891).

Both sexes may be compared with *A. bifasciatus*, Brem. The wings are much shorter, broader, and rounder in contour; the ground-colour is dark shining brown; the apical spots are confluent, forming a dash. On the under surface the apex of primaries and outer margins

of all the wings are clouded with bluish grey, and the dark transverse bands of the secondaries are not bordered with paler. The fringes also are not chequered.

Expanse, ♂ 45, ♀ 48 millim.

"Un peu plus petit que son congénère *bifasciatus*, dont il diffère par ses ailes inférieures en dessous saupoudrées le long du bord marginal d'atomes gris violâtre, et par ailleurs d'une teinte brun uni, traversée par deux bandes maculaires sinuées à peine perceptibles, allant du bord costal au bord anal. On ne voit ces bandes, qui ne se distinguent presque pas de la couleur du fond, que grâce aux lignes fort peu accentuées elles-mêmes qui les limitent. De plus la frange n'est pas entrecoupée comme chez *bifasciatus*." (*Oberthürer, l. c.*)

Occurs at Ta-chien-lu, Pu-tsu-fong, and Chow-pin-sa, taken in May and June, and at Ni-tou and Wa-ssu-kow in July and August. M. Oberthürer records specimens from Yunnan.

Genus SATARUPA.

Satarupa, Moore, Proc. Zool. Soc. Lond. 1865, p. 789; Watson, Proc. Zool. Soc. Lond. 1893, p. 46.

"Palpi stout, densely pilose, erect, projecting in front of the head; third joint minute, conical. Antennæ moderate. Body very stout. Legs slender; femora slightly pilose beneath; hind tibiae pilose at the side and beneath; middle tibiae with a pair, and hind tibiae with two pairs of apical spurs. Wings—fore wing acute; costa nearly straight, exterior margin oblique; hind wing rounded exteriorly in the male, angled at the apex, and in the middle of exterior margin of the female." (*Moore, l. c.*)

"Antennæ: club slender, bent into a hook, terminal portion long. Palpi porrect; third joint short, bluntly conical. Fore wing: outer margin strongly oblique, inner and outer margins subequal; cell less than two thirds the length of costa; di-ocellulars inwardly oblique; vein 12 reaching costa before the end of cell; vein 3 shortly before end of cell, twice as far from 2 as from 4; vein 2 twice as far from end of cell as from base of wing. Hind wing much elongated, outer margin sinuate: vein 7 well before end of cell, twice as far from 8 as from 6; vein 3 immediately before end of cell; vein 2 twice as far from base of wing as from end of cell.

"In the type species vein 5 of the hind wing is well developed, but it is barely traceable in the other species of the genus.

"Hind tibiae with two pairs of spurs. In the male the hind tibiae are fringed along their upper edge, and the inner side of the tibiae is clothed with long coarse recumbent hairs.

"Closely allied to *Dumia*, from which it may be separated by the shape of the wings, especially of the hind wing, by the much greater length and more decided hook in the terminal portion of the antennal club, and by the scaling of the hind tibiae of the male.

"Entirely confined to Asia." (*Watson, l. c.*)

Satarupa nymphalis.

Tajuides nymphalis, Speyer, Stett. ent. Zeit. xl. p. 318 (1879); Staudinger, Rom. sur Léop. iii. p. 153, pl. viii. fig. 4 (1887).

"Niger, corpore subtus albido s. albo, palpis croceis, apice nigris; al. anterioribus maculis albis

pellucidis: 1 cellulae mediae, 9 in serie curva transversa (5 minoribus apicem versus, 4 inferioribus quadrangulis pono medium) depositis; al. posterioribus fascia media lata nivea, subtus in basim virescenti-pilosulam effusa." (*Speyer, l.c.*)

This species greatly resembles *Satarupa gopala*, Moore, but it is larger and may be distinguished by the following characters:—Primaries: the spot at end of the discoidal cell is rather quadrate than triangular, and the three subapical spots nearest costa are elongate, of almost uniform width, and contiguous. Secondaries: the outer third is black, intersected by a transverse, curved, ill-defined, pale line, the portion within this line is more or less broken up into oblong spots; the white portion of the fringes is very narrowly interrupted with black at extremities of the nervules.

Occurs at moderate elevations in June and July at Omei-shan, Moupin, and Kwei-chow, Western China, and at Chang-yang and Kiukiang, Central China, and also in Northern China. Christoph met with the species at Vladivostock, whence Speyer received the type, and Dörries at Suifun, Amurland.

Genus DAIMIO.

Daimio, Murray, Ent. Mo. Mag. xi. p. 171 (1875); Watson, Proc. Zool. Soc. Lond. 1893, p. 47.

"Antennae costae medium superantes, gracillimae, clavâ fusiformi, hamata. Palpi sat breves, squamosi, articulo ultimo distincto.

"I have very briefly characterized this genus, which only contains, at present, a single species, *D. tethys*, Mén. Hitherto this insect has been associated doubtfully with *Pyrgus* (sect. *Erymnis*) or with *Nisoniades*, but it differs considerably from both in structure. The antennae are long and very slender, and terminate in a gradually formed hooked fusiform club. They are provided with a tuft of hair at the base. The palpi have the second joint covered beneath with squamous scales, whilst the terminal joint is scantily clothed with short hairs. The fore wings of the male appear to be destitute of the costal fold found both in *Pyrgus* and *Nisoniades*." (*Murray, l.c.*)

"Antennae: club moderate, terminal crook bent at about right angles. Palpi perfect; third joint short, obtusely conical. Fore wing: outer margin slightly oblique; inner margin longer than outer margin; cell less than two thirds the length of costa; vein 12 reaching costa before the end of cell; discocellulars suberect; vein 3 close to end of cell, more than twice as far from 2 as from 4; vein 2 twice as far from end of cell as from base of wing.

Hind wing hardly elongated, outer margin sinuate; vein 7 shortly before end of cell, more than twice as far from 8 as from 6; discocellulars very faint, almost erect; vein 5 barely traceable; vein 3 shortly before end of cell; vein 2 twice as far from base of wing as from end of cell. Hind tibiæ with two pairs of spurs.

.. Male without costal fold, but with a tuft of hairs attached to the proximal end of hind tibiæ.

.. Confined to Asia." (Watson, l. c.)

Daimio tethys.

Pyrgus tethys, Ménétris, Cat. Mus. Petr. p. 126, pl. x. fig. 8 (1857); Oberthür, Etud. d'Entom. v. p. 24 (1880).

Daimio tethys, Fixsen, Rom. sur Léop. iii. p. 314 (1887); Staudinger, op. cit. vi. p. 215 (1892).

Daimio tethys, Pryer, Rhop. Nihon. p. 33, pl. x. fig. 6 (1889).

.. *Façes* de la *P. malva*, Fabr.: ailes brun-foncé en dessus, plus clair en dessous; les supérieures de part et d'autre avec cinq taches blanches transparentes sur leur disque et trois points au sommet; les inférieures sans taches, mais en dessous avec cinq points blancs sur la frange du bord extérieur.

.. Cette espèce est de la taille et à-peu-près de la forme de la *P. malva*, Fabr., et présente également les secondes ailes dentées à leur bord extérieur.

.. Les ailes sont en dessus d'un brun très foncé: les supérieures sont ornées sur leur disque de cinq taches blanches transparentes, dont: la première étroite et petite, est placée au dessus de la nervure costale, sur le bord antérieur; la seconde, assez grande, carrée, est située au dessous et dans la cellule discoidale; la troisième, moins grande, est placée au dessous, et est arrondie inférieurement; puis, vient un point situé extérieurement, entre ces deux dernières taches; enfin, la cinquième tache placée plus en dedans, et non loin de la troisième et du bord interne de l'aile. Puis près du sommet se voient trois petites taches carrées, transparentes, placées l'une au dessous de l'autre; enfin deux points transparents, très petits, placés un peu plus bas, et plus en dehors. Les ailes inférieures offrent sur leur disque trois ou quatre taches, très peu distinctes, et de couleur plus foncée.

.. En dessous, les ailes supérieures ne diffèrent point du dessus, mais les inférieures présentent sur la frange du bord externe, cinq traits blancs qui s'avancent un peu entre les nervures et rendent la dentelure de ce bord plus sensible; ces traits se reproduisent en dessous mais moins avancés sur la surface de l'aile. La frange du reste, est brune, et présente aux ailes supérieures un petit point blanc sur chaque échancrure du bord extérieur, et un petit trait blanc près de l'angle interne.

.. Cette espèce a été rapportée du Japon par Mr. Goschkevitch." (Ménétris, l. c.)

The general absence of a white band on secondaries is the only character that separates *tethys* from *D. sinica*. Oberthür refers to an example of *tethys*, taken by Abbé David in N. China, which has a well-defined white band, and he states that he has intermediate specimens from Amurland. Staudinger (Rom. sur Léop. vi.) says that he received specimens, similar to those mentioned by Oberthür, from Herz, who took them in the neighbourhood of Peking, and

suggests for this form the varietal name *chinensis*. I have specimens from Corea and Amurland in which the band is distinctly indicated. Possibly it may ultimately be proved that *sinica* is an extreme form of *tethys*, but so far the evidence does not justify their being united.

In Pryer's collection there is an extraordinary aberration, in which all the spots on primaries are united, forming an irregular V-shaped patch, interrupted by the nervures, and a bar at the extremity of the cell. The species is common throughout Japan.

Graeser (Berl. ent. Zeit. 1888, p. 101) states that in Amurland this species occurs commonly in woods at Chabarofka from the middle of May to the end of June, and more rarely at Vladivostock. He met with larvæ at the end of August rolled up in oak and hazel leaves, and describes them as light green, thickly covered with short reddish hairs; head round and black; the pupa, which lives through the winter, is dusted with white.

Distribution. Amurland, Japan, North China, Corea.

Daimio sinica.

Pterygospidea sinica, Felder, Wien. ent. Mon. vi. p. 30 (1862); Alphéraky, Rom. sur Léop. v. p. 122, pl. v. figs. 9, a, b (1889).

Pterygospidea moorei, Mabille, Ann. Soc. Ent. Fr. 1876, p. clii.

Daimio felderi, Butler, Ann. & Mag. Nat. Hist. (5) vii. p. 140 (1881).

"Alis fuscis, anticis maculis tribus discalibus punctisque quinque subterminalibus hyalino-albis, fasciola interna alba, posticis fascia subbasali alba, subtus macula punctis subcostali lituraque disco-cellulari fusco notata, ibidem maculis exterioribus obsolete albidis. ♂.

"Unum specimen circa Ning-po captum Rev. Dom. Muirhead nobis commisit. Minus est, quam *M. japyctus*, Cram., et *actus*, Feld. In India septentrionali similis occurrit species." (Felder, l. c.)

Var. **moorei**, Mabille. "Nigra, alis anticis ferentibus duas series punctorum, unam apicalem trium punctorum subcostalium et duorum inferius positorum obliquorumque; alteram in disco 5 in femina, quatuor in mare (costali in hoc deficienti). Alis posticis unam fasciam albam transversam offerentibus, ad medium dilatam in mare, punctis nigris inferius notatam, 5 numero, et in parte limbi nigra positam ita ut dimidio fere in fasciam albam procedant. Fimbria alba, nigro semiinterrupta, subtus alis eoneoloribus aut potius fuscis, punctis melius scriptis; e punctis fasciæ albe posticarum duo in fascia alba posita sunt; basis earumdem cinereo-carneæ in mare, obscurior in femina, cum 3 punctis nigris ad angulum externum, corpus et pedes cinereo colore; palpis subtus albidis, articulo ultimo nigro." (Mabille, l. c.)

Var. **felderi**, Butler. "Dark brown, with white markings: primaries exactly as in *D. tethys*; secondaries crossed by a white belt, which passes through a nearly complete circular series of black spots; anal three fourths of fringe and four marginal spots white; posterior margins

of abdominal segments white. Base of secondaries and body below bluish grey. Expanse of wings 1 inch 6 lines.

"A tolerably common species; its position is between *D. tethys* and *D. sinica* of Feller; it appears to represent the latter in Japan, and differs from it in the smaller spots on the primaries, and in the black spots being visible upon the white belt of the secondaries." (*Butler, l. c.*)

This species varies considerably in size and in the shape, size, and pattern of the subhyaline spots on primaries, especially the subapical ones; the width of the white band on secondaries is also a variable character, and the base of under surface of secondaries is sometimes bluish grey, sometimes fuliginous grey, and sometimes hardly different in colour to the general area.

The type of Butler's *felderi*, which is certainly only a form of *sinica*, is said to have been taken by Maries at Nikko, but it is more probable that he obtained the specimen at Kiukiang, as no other collector has recorded any form of *sinica* from Japan, where it seems to be replaced by *tethys*.

I found *sinica* plentiful at Foochau and Ningpo in April, and it appears to have been common at moderate elevations in most of the localities in China visited by my collectors. Mabilles's type of *moorei* was taken at Moupin.

Alphéraky records the species from Hou-tchi, N.E. Thibet.

Daimio narada. (Plate XXXVIII. fig. 14, var.)

Saturapa narada, Moore, Journ. Asiat. Soc. Beng. 1884, p. 50.

Pterygospidea diversa, Loech, Entomologist, xxiii. p. 46 (1890).

"Upperside purpurascens violet-brown: fore wing with three small upper and two lower subapical semidiaphanous white spots, a small erect oval spot at lower end of the cell, a slightly larger quadrate spot on the disc between upper and middle medians, and a broad band formed of three quadrate spots increasing in width from end of cell to posterior margin; hind wing with a broad white transverse medial band, the outer border with an ill-defined upper spot. Cilia edged with white. Underside marked as above: the hind wing with the band showing a more defined meander outer border and a well-separated upper spot.

"Expanse $1\frac{4}{10}$ inch." (*Moore, l. c.*)

Var. *diversa*, Loech. (Plate XXXVIII. fig. 14. ♂.) Brownish black; primaries have three subhyaline spots on the disc, and five very small ones towards apex, the central spots form a triangle, a lunar or linear one at end of discoidal cell, one rather larger and more quadrate beyond, and a still larger one below. of the outer five the second is punctiform and placed inwards, the fourth rather outwards, and the remaining two are directly under the first; a white spot in the submedian interspace under the larger subhyaline one. Secondaries have a broad white central band terminating on the inner margin opposite a white band on the abdomen, and there are some black spots on its upper external edge. Fringes of primaries black, spotted with white above inner angle; of secondaries white, tinged with grey, becoming darker towards outer angle, and with a slender blackish line at their base preceded by some

white spots. Under surface as above, but the white spot in submedian interspace is rather larger, and is followed by a whitish shade: the central band of secondaries is also wider, and encloses two black spots, there is a faint indication of a pale submarginal line; there are some bluish-grey hairs at the base. Head and thorax tinged with yellow. Palpi yellowish, and the pectus tinged with same colour.

In Möller's collection, which I have recently acquired, there is a series of 18 Sikkim examples of *D. narada*, Moore, a species I was not previously acquainted with. I now find that the insect I described as "*Pterygospidea*" *diversa* is not really specifically distinct from *D. narada* and can only rank as a local form of that species.

I have specimens of var. *diversa* from Chang-yang, Central China; Wa-shan, Western China; and I also met with it at Foochau in April. All these differ from Sikkim specimens in having narrower white bands on secondaries, and the spots on primaries are smaller and less confluent.

Distribution. Sikkim; Western and Central China.

Genus COLADENIA.

Coladenia, Moore, Lep. Ceyl. i. p. 180 (1881); Watson, Proc. Zool. Soc. Lond. 1893, p. 49.

"Antennae: club rather robust, recurved at tip. Palpi porrect; third joint short, obtusely conical. Fore wing: inner and outer margins subequal; cell less than two thirds the length of costa; vein 12 reaching costa well before the end of cell; discocellulars suberect, the lower the longer; vein 3 shortly before the end of cell; vein 2 more than twice as far from end of cell as from base of wing. Hind wing: outer margin sinuate; vein 7 very close to end of cell; discocellulars and vein 5 barely traceable; vein 3 immediately before end of cell; vein 2 considerably nearer to end of cell than to base of wing. Hind tibiae with two pairs of spurs, and in the male with a very long tuft of hair attached to the proximal end.

"Type, *imtrani*, Moore.

"Asiatic and African." (*Watson, l. c.*)

Coladenia dan. (Plate XXXVIII. fig. 10, var.)

Papilio dan, Fabricius, Mant. Ins. ii. p. 88 (1787).

Hesperia dan, Horsfield & Moore, Cat. Lep. Mus. E. I. C. i. p. 253 (1857).

Coladenia dan, de Nicéville, Journ. Asiat. Soc. Beng. lii. p. 100 (1883); Distant, Rhop. Malay. p. 398, pl. xxxv. fig. 27 (1886).

Hesperia fatih, Kollar, Hügel's Kaschmir, iv. p. 454, pl. xviii. figs. 5, 6 (1848).

"P. P. V. alis caudatis obscure cinereis fusco punctatis; anticis maculis fenestratis.

"Habitat Tranquebaria, Dom. Pflug.

"Corpus parvum obscure cinereum, antennis uncinatis nigris. Alae omnes obscure cinerae punctis

- strigaeque postica fuscis. Antice in medio maculis tribus anteriore angulata et punctis quatuor minutis approximatis ad marginem crassiorem hyalinis. Subtus concolores." (*Fabricius, l. c.*)
- "Wings above rufous brown; anterior wings with four discal greyish-white spots, one largest and sublunate in cell, a smaller spot above it and two beneath cell divided by the second median nervule, obscure dark fasciæ; posterior wings with discal and outer marginal dark fasciæ. Wings beneath as above, but slightly paler. Body and legs more or less concolorous with wings.
- "Expanse 30 millim." (*Distant, l. c.*)
- "Alis fulvo-brunneis; anticis medio maculis quatuor, adjacentibus punctis duobus maculisque tribus minoribus ad apicem albis diaphanis, posticis fasciis duabus obscurioribus obsolete."
- "Expans. alar. 1" $5\frac{1}{2}$ "" (*Kollar, l. c.*)

The female (hitherto unnoticed) is rounder in the wing than the male, and the spots on primaries are subdiaphanous white.

Occurs fairly commonly in Western China at Chia-kou-ho, Wa-shan, and Ta-chien-lu.

None of the Western Chinese specimens that I have seen to agree exactly with those from Sikkim; they are more suffused and, as a rule, considerably larger. The most typical example in my Chinese series of *C. dan* is one taken by myself at Foochau in April.

From Moupin, Wa-ssu-kow, and Pu-tsu-fong I have received a form which differs so considerably from the type that I describe it as:—

- Var. **dea**, var. nov. (Plate XXXVIII. fig. 10, ♂.) Larger than the type. Primaries uniformly darker; all the hyaline spots much larger, exhibiting a tendency to become confluent; subapical spots elongate and placed obliquely; sometimes there are one or two small spots below the subapical three. Under surface much brighter than in typical *C. dan*. The yellow transverse bands on secondaries much more conspicuous; primaries also more suffused with yellow and the fringes more distinctly chequered with white.
- Expanse 48 millim.

According to Elwes *C. dan* is common in Sikkim up to 4000 feet from March to October.

Distribution. Continental India, N.W. Himalayas, Cachar, Burmah, China, Malay Archipelago.

Coladenia vitrea, sp. nov. (Plate XLI. fig. 15, ♂.)

Male. Blackish grey, with numerous semitransparent spots. Primaries have six central and five subapical spots, the first, third, fifth, and sixth of central series small, and the fourth and fifth subapical minute. Secondaries have a subbasal spot, a large almost quadrate central spot with a small linear one below it and a curved series of seven spots beyond it; the anal fourth of these wings is greyish. Fringes of primaries of the ground-colour; of the secondaries white, except at outer angle, where they are of the ground-colour, spotted with

black at ends of the nervules. Under surface similar to above, but the basal and inner marginal areas of primaries and the whole of disc of secondaries are suffused with bluish grey. Expanse 38 millim.

Mr. H. Grose Smith has one male specimen, taken at Ta-chien-lu by a native collector; this he has very kindly placed at my disposal to figure and describe.

Genus CELÆNORRHINUS.

Celænorrhinus, Hübner, Verz. p. 106 (1816); de Nicéville, Bomb. Nat. Hist. Journ. iv. p. 177 (1889); Watson, Proc. Zool. Soc. Lond. 1893, p. 49. Type, *eligius*, Cramer. *Gehlota*, Doherty, Journ. Asiat. Soc. Beng. lviii. pt. 2, p. 131 (1889). Type, *sumitra*, Moore.

“Antennæ: club moderate, recurved at apex. Palpi suberect, terminal joint minute, second joint pressed close against the face. Fore wing: inner and outer margins subequal; cell less than two thirds the length of costa; vein 12 reaching costa almost opposite the end of cell; discocellulars suberect, the lower the longer; vein 3 shortly before the end of cell; vein 2 more than twice as far from end of cell as from base of wing. Hind wing: outer margin sinuate; vein 7 well before the end of cell, about twice as far from vein 8 as from 6; discocellulars faint, erect; vein 5 barely traceable; vein 3 immediately before the end of cell; vein 2 twice as far from base of wing as from end of cell. Hind tibiae with two pairs of spurs, and in the male with a tuft of hairs attached near the proximal end.

“This is a cosmopolitan genus, species belonging to it occurring in Asia, Africa, and South America.” (*Watson, l. c.*)

Celænorrhinus maculosa. (Plate XXXIX. fig. 2, ♂.)

Pterygospidea maculosa, Felder, Reise Novara, Lep. iii. p. 528, pl. lxxiii. fig. 7, ♂ (1867).
Celænorrhinus maculosa, de Nicéville, Bomb. Nat. Hist. Journ. iv. p. 180 (1889).

Mal. “Alæ supra fusca, ad basin cervino pilosa, antica macula parva rotundata inferiore subbasali, una cellulari, duabus inter ramos medianos, inferiore multo majore, quinta infra hanc parvula, sexta extra eam minore difformibus, tribus anticis congestis duabusque infra eas prope marginem externum pellucide albis, in certo situ sericeo nitidis, postica macula subcostali, duabus in cellula, quinque statim pone hanc (secunda majore), altera exteriore rotundata parvula inter ramos subcostales aliisque sex submarginalibus (supernis duabus punctiformibus) ochraceo-flavis, ciliis albidis intersectis.

“Alæ subtus dilutiores, antica insuper striis duabus anticis e basi ochraceis, postica maculis supernis majoribus, secunda subcostali, aliis cuneatis basalibus vittaque irregulari interna anctis, pallide ochraceis.

“Facies, palpi et pectus pallide ochracea. Abdomen fuscum, ochraceo fasciatum.” (*Felder, l. c.*)

The commonest species of the genus occurring in China. I have received large numbers from Kinkiang, Omei-shan, and Moupin.

It varies considerably in expanse, also in the size of the spots on primaries. The female only differs from the male in having rounder wings.

Celænorrhinus consanguinea. (Plate XXXIX. fig. 3, ♂.)

Celænorrhinus consanguinea, Lecch, Entomologist, xxiv., Suppl. p. 61 (1891).

Dark brown, sprinkled with ochreous scales, especially on the basal third of primaries; these wings have a central series of five diaphanous spots and five towards apex; there is also a spot midway between central series and base of wing. The spots on secondaries are pale orange, and comprise a large one in the centre of the wing, three between it and the abdominal margin, and one, or sometimes two, towards the base of the wing, beyond there is a transverse series of seven or eight, but that nearest the costa is sometimes absent. On the underside of primaries there are two extra spots in the submedian interspace; on the secondaries all the spots are larger in size and paler in colour, and there are three distinct spots in the basal area. The fringes of the primaries are of ground-colour, spotted and dashed with pale yellowish white, and those of the secondaries are pale yellowish white, with patches of the ground-colour at the extremities of the nervules. Antennæ are black, broadly banded with whitish before the club.

Expanse 50 millim.

This species agrees in many respects with *C. pero*, de Nicéville, Bomb. Nat. Hist. Journ. iv. p. 183, pl. B. fig. 12 (1889); but apart from the more rounded contour of outer margin of primaries, the different character of the markings on antennæ and fringes of primaries will, in conjunction with the additional spots on the under surface, separate these two closely-allied species.

The sexes do not differ in colour or ornamentation. Occurs in June and July at altitudes ranging from 3000 to 6000 feet at Moupin, Omei-shan, Wa-shan, and Ta-chien-lu in Western China, also at Ichang in Central China.

Celænorrhinus sumitra. (Plate XXXIX. fig. 1, ♂.)

Plesioneura sumitra, Moore, Proc. Zool. Soc. Lond. 1865, p. 787.

Celænorrhinus sumitra, de Nicéville, Bomb. Nat. Hist. Journ. iv. p. 184 (1889).

“*Male* and *female* dark olive-brown, paler at the base.

“*Male*. Fore wing with an oblique discal series of four conjugated semitransparent white spots, the first and second large and quadrate, the other two very small, first one within the extremity of the cell, second and third beneath it, fourth exteriorly before the juncture of the first and second; a series of five small similar spots obliquely before the apex. Hind wing with a submarginal row and a few discal bright orange-yellow spots; cilia of hind wing broadly alternate brown and orange-yellow. Underside as above; the orange-yellow spots on the hind wing more clearly defined. Antennæ above silvery white. Palpi and front of thorax beneath pale yellow. Abdomen with narrow orange-yellow segmental bands.

“*Female* as in male, but having also a yellow costal spot above the oblique discal series of white spots.

“Expanse, ♂ 2 inches, ♀ 2 $\frac{1}{2}$ inches.

“N.E. Bengal.” (*Moore, l. c.*)

Occurs at Omei-shan and Moupin in July at an elevation of from 3000 to 4000 feet.

Mr. Elwes says that it is rare in Sikkim, and that he has taken it in the forest near Rikisum, in British Bhotan, at an elevation of from 5000 to 7000 feet, in August.

Celénorrhinus aspersa. (Plate XXXIX. fig. 4, ♂.)

Celénorrhinus aspersa, Lecch, Entomologist, xxiv., Suppl. p. 61 (1891).

Male. Similar to *Celénorrhinus (Pterypospidea) maculosa*, Feld., but larger, and the outer margin of primaries is straighter; the antennæ are whitish in front: the spots on the primaries are numerically the same, but those in the median and submedian interspaces are elongated and placed wider apart. On the secondaries the number and arrangement of yellow spots is almost identical in both species, but in *C. aspersa* they are larger, and the three placed between discal spot and abdominal margin are more or less confluent. On the under surface the basal area of secondaries is dusted with yellowish scales. Fringes of primaries are of the ground-colour, and of the secondaries yellow, except along the costal third of outer margin, where they are of the ground-colour.

One specimen from Chia-kou-ho. Taken at an elevation of 2000 feet in July.

Celénorrhinus pluscula, sp. nov. (Plate XXXIX fig. 6, ♀.)

Female. Very similar to the same sex of *C. pluscifer*, de Nicéville*, but on the primaries the costal spot of central series is absent, and on the secondaries there are complete central and submarginal series of yellow spots but only one subbasal spot; the fringes of these wings are yellow chequered with the ground-colour, except at outer angle, where they appear to be entirely of the ground-colour.

The male, of which sex I have only one example, has the primaries rather more pointed, but agrees in other respects with the female.

Occurs in Western China at Moupin, Omei-shan, Pu-tsu-fong, and Wa-ssu-kow, in June and July, at from 5000 to 8000 feet.

Celénorrhinus lucifera, sp. nov. (Plate XXXIX. fig. 5, ♀.)

Female. Fuliginous brown, powdered with ochreous yellow on the basal and inner marginal areas of primaries. Primaries with the markings very similar to those of *C. pulcherrima*, Moore †, but the yellow spot in submedian interspace, one third from base, is clearer. Secondaries have the discal area clothed with long ochreous-yellow hairs, and are marked with yellow as follows:—a subbasal spot, a central series of spots, the first transversely elongate and the others obscure, a submarginal series of seven spots. Fringes of primaries hardly paler than the ground-colour, marked with yellowish towards the inner angle; of secondaries yellowish grey, marked with the ground-colour at extremities of the nervules. Antennæ whitish above and blackish beneath; club whitish streaked with blackish.

Expanse 63 millim.

* Bomb. Nat. Hist. Journ. iv. p. 182, pl. B. fig. 13, ♀ (1889).

† Proc. Zool. Soc. Lond. 1865, p. 787.

One example taken at Moupin in July.

This species resembles *C. pyrria*, de Nicéville*, in the maculation of secondaries, but the markings on primaries are different.

***Celænorrhinus omeia*, sp. nov.** (Plate XXXVIII. fig. 5, ♂.)

Ochreous brown, venuration of all the wings blackish; the primaries are blackish between the costa and subcostal nervure, and sprinkled with blackish scales on the outer third of the wing; there is a large whitish subhyaline spot at the end of the cell, three others in the interspaces below, the third being the smallest, and three towards apex. Secondaries have a central transverse series of elongate black spots. Under surface ochreous brown, thickly powdered with blackish scales, and tinged with purplish towards margins, the white spots of the primaries are more glassy and there is an extra opaque spot above the cell; the black spots of secondaries are only seen on the under surface in the female. Fringes brownish grey, darker at their base. Antennæ black; palpi yellow.

Expanse, ♂ 60 millim., ♀ 70 millim.

Occurs at Omei-shan in June and July.

Although I have placed this species in *Celænorrhinus* I think that a new genus will have to be created for it and its allies. It appears to be congeneric with *C. huchananii*, de Nicéville, and superficially resembles *Casyapa phanaeus*, Hewitson ‡.

***Celænorrhinus davidi*.** (Plate XXXIX. fig. 9, ♂.)

Pterygospidea davidii, Mabille, Ann. Soc. Ent. France, 1876, p. liv.

Celænorrhinus davidii, de Nicéville, Bomb. Nat. Hist. Journ. iv. p. 186 (1889).

* Nigra, sed maculis albis ita variegata ut tessellata videatur et paululum generis *Melanargia* speciem referat. Macula alba in basi anticarum nigrescenti, ovalis, elongata; fascia 5 macularum albarum in disco quarum una linearis ad costam; secunda maxima quadrata in cellula, quam exterius punctum triangulare, nigrum, cinereo circumdatum, sequitur; tertia exterior sagittata; quarta elongata, et quinta quadrata, ambe utrinque emarginate; fascia deinde ante-marginalis, sinuata, offerens prius sex puncta bene scripta, alba, 4 subapicalia, et duo majora ad marginem externum, et inferius tria alia obsoleta, quorum ultimum magnum dentatum, ad marginem internum; ante marginem externum; versus apicem sunt tres macule obsoletæ, cinereæ. Alæ posticæ fere albæ, et color cinereo-niger in quatuor maculas aut macularum ordines reductus; scilicet unam basalem maculam, utrinque junctam macularum subbasalium ordini in medio interrupto, et quatuor maculas conglomeratas habenti; tertium ordinem macularum minorum in disco, et quartum marginalem majorum et vix nervis divisarum. Margo abdominalis anguste niger. Fimbria anticarum

* Bomb. Nat. Hist. Journ. iv. p. 181, pl. B. fig. 11, ♀ (1889).

† Bomb. Nat. Hist. Journ. 1889, p. 187, pl. B. fig. 2, ♀.

‡ Descr. Hesp. p. 14 (1867); Distant, Rhop. Malay, p. 386, pl. xxxv. fig. 18 (1886).

nigra ut et nervi: posticarum alba. Collare, palpi aurantiaco colore. Pagina inferior pallidior, maculis magis separatis: abdomen album, pedes cinerei. Antennæ nigrae." (*Mabille, l. c.*)

Occurs in Western China at Moupin, Wa-ssu-kow, and Chia-kou-ho; and in Central China at Chang-yang and Kiukiang. Pratt says that it flies around high trees.

Two specimens from Kiukiang differ from those from the other localities in being larger and in having the ground-colour darker and the spots smaller.

I have followed de Niceville in referring this species to *Celenorrhinus*, but probably a new genus will have to be founded for its reception.

Genus TAGIADES.

Tagiades, Hübnér, Verz. p. 108 (1816); Watson, Proc. Zool. Soc. Lond. 1893, p. 53.

Type, *japetus*, Cram.

Pterygospidea, Wallengren, Rhop. Caffr. p. 53 (1857). Type, *flesus*, Fabr.

"Antennæ: club slender, bent at about a right angle, terminal portion rather long. Palpi perfect, third joint minute. Fore wing: inner and outer margins subequal; cell less than two thirds the length of costa; vein 12 reaching costa well before end of cell: discocellulars suberect, the lower the longer; vein 3 shortly before end of cell, three times as far from 2 as from 4; vein 2 almost twice as far from end of cell as from base of wing: lower margin of cell between origins of veins 2 and 3 strongly arched. Hind wing evenly rounded: vein 7 well before the end of cell, about twice as far from 8 as from 6; discocellulars and vein 5 very faint; vein 3 shortly before end of cell, twice as far from 2 as from 4; vein 2 considerably nearer to end of cell than to base of wing. Hind tibiæ fringed, and with two pairs of spurs.

"It is quite impracticable to separate *Pterygospidea* from *Tagiades*, the only difference being that in *flesus* the outer margin of the fore wing is slightly excavated just above the outer angle, which is not the case in *japetus*; when, however, one tries to apply this difference to other species it is found to be a vanishing quantity, and quite valueless as a generic character." (*Watson, l. c.*)

Tagiades atticus. (Plate XXXVIII. fig. 13, ♂.)

Hesperia atticus, Fabricius, Ent. Syst. III. i. p. 339 (1793).

Tagiades atticus, Elwes, Trans. Ent. Soc. Lond. 1888, p. 457.

"*H. U. alis rotundatis: anticis fuscis nigro maculatis punctisque fenestratis, posticis hyalinis atro maculatis.*

"Habitat in India Dom. Lund.

"Statura omnino præcedentis [*Cicera*, Fabr.]. Ale antice obscure maculis aliquot disci nigris punctisque quatuor aut quinque minutis, hyalinis, subtus fusce punctis hyalinis. Postice rotundate, hyaline maculis disci atris, subtus pallidiores maculis aliquot nigris. Antennæ uncinatæ." (*Fabricius, l. c.*)

Occurs in Western China at Omei-shan, Chia-ting-fu, and Chia-kou-ho.

Except that they are rather larger, Chinese specimens are identical with those from Sikkim and exhibit the same range of variation. The primaries are sometimes traversed by a series of subdiaphanous white spots extending from costa to inner margin. In a few specimens the black spots on lower two thirds of submarginal area of secondaries are well separated and clearly defined, but usually the spots are confluent and form a broad submarginal band.

Elves says that the species occurs all along the Himalayas and is found in Sikkim up to 4000 feet, from March to December. In the Malay Peninsula it is represented by a form which Butler has named *calligana* (Trans. Linn. Soc. (2), Zool. i. p. 556, pl. lxxix. fig. 11; Distant, Rhop. Malay. p. 387, pl. xxxiv. fig. 6.)

Distribution. Continental India, Ceylon, Malacca, Malay Peninsula, and Western China.

Genus CTENOPTILUM.

Ctenoptilum, de Nicéville, Journ. Bomb. Nat. Hist. Soc. 1890, p. 220; Watson, Proc. Zool. Soc. Lond. 1893, p. 60.

"Fore wing narrow, elongated; costa arched at base, then straight to apex; apex acute; outer margin at right angles to costa from apex to termination of third median nervule, this portion also being slightly excavated, from third median nervule to inner angle strongly inwardly oblique, also slightly concave; inner angle rather acute; inner margin sinuous; costal nervure very short, not nearly reaching opposite to the apex of the discoidal cell; first, second, and third subcostal nervules also very short, rapidly reaching the costa, fourth subcostal long, extending to apex of wing, the bases of all the subcostals nearly equidistant; terminal portion of subcostal nervure reaching outer margin below apex of wing; discoidal cell long, narrow, reaching to more than half though less than two thirds the length of the wing; upper discocellular nervule short, straight, outwardly oblique; middle and lower discocellulars straight, slightly inwardly oblique, the lower a little longer than the middle; second median nervule arising considerably before the lower end of the cell; first median arising much nearer to the base of the wing than to the lower end of the cell; submedian nervure sinuous, following the outline of the inner margin; internal nervure short, running to the submedian nervure as usual. Hind wing with the base of the costa much produced, thence gently curving to apex; outer margin slightly produced, tooth-like at apex of first subcostal nervule, very strongly at third median nervule, thence inwardly

oblique to anal angle and slightly concave; anal angle rounded; inner margin nearly straight; costal nerve curved, reaching the apex of the wing; first subcostal nerve originating long before the apex of the discoidal cell; discocellular nervules of equal length, almost straight, slightly outwardly oblique; discoidal nervule fine but distinct; second median nervule given off close to the lower end of the cell: first median arising nearer to lower end of the cell than to the base of the wing; submedian and internal nerve almost straight. Antennae about half as long as the costa of fore wing, with a well-formed club: thorax rather stout; abdomen rather slender, not quite reaching to anal angle of hind wing.

"Male with no secondary sexual characters on the wings, but with a dense tuft of hairs attached to the anterior end of the tibia of the hind legs, the hairs extending to the apex of the first joint of the tarsus. Female like the male, except that the wings are rather longer and broader.

"Type '*Achlyodes*' *vasava*, Moore." (*de Nicéville, l. c.*)

Ctenoptilum vasava. (Plate XII, fig. 13, ♂.)

Achlyodes vasava, Moore, Cat. Lep. Mus. E. I. C. i. p. 252 (1857); Proc. Zool. Soc. Lond. 1865, p. 786.

Antigonus vasava, Elwes, Trans. Ent. Soc. Lond. 1888, p. 458.

"Upperside dull ferruginous, palest on the hind wing; fore wing slightly suffused with blackish along the posterior margin, an irregular series of various shaped semitransparent spots disposed across the disk, with an exterior blackish transverse streak; hind wing with the base suffused with blackish; a subbasal agglomerated series of irregular-shaped semitransparent spots. Underside paler, marked as above, but without the transverse black outer streak on the fore wing. Palpi and body beneath whitish. Legs ferruginous.

"Expanse $1\frac{1}{2}$ inch." (*Moore, l. c.*)

I met with this insect at Ningpo in April, and Pratt obtained it in May at Kiukiang. Both Pratt and Kricheldorf failed to meet with it in any other locality in China that they visited.

The Chinese specimens are larger than those from Sikkim and have the subhyaline spots better developed, but do not differ from them in any other respect. The sexes are alike in colour and pattern.

Elwes says that in Sikkim *C. vasava* is common in April and May up to about 3000 feet.

Genus HESPERIA.

Hesperia, Fabricius, Ent. Syst. iii. vol. i. p. 258 (1793); Watson, Proc. Zool. Soc. Lond. 1893, p. 64. Type, *malce*, Linn.

Pyrgus, Hübner, Verz. p. 109 (1816). Type, *syrichtus*, Fabr.

Scelothrix, Rambur, Cat. Léop. Andal. i. p. 63 (1858). Type, *carthami*, Hübn.

Syrichtus, Boisduval, Icones, p. 230 (1832-33). Name sinks, being derived from species in genus.

“Antennæ: club robust, arcuate, blunt at the tip, no terminal crook. Palpi suberect; second joint laxly clothed with longish scales; third joint slender, blunt, almost concealed in scaling of second joint. Fore wing: inner and outer margins subequal; cell less than two thirds the length of costa; vein 12 reaching costa well before the end of cell; discocellulars suberect, the lower the longer; vein 3 shortly before end of cell, more than twice as far from 2 as from 4; vein 2 nearer base of wing than to end of cell. Hind wing usually evenly rounded, occasionally slightly crenulate; vein 7 very shortly before end of cell; discocellulars and vein 5 very faint; vein 3 immediately before end of cell; vein 2 nearly equidistant from base of wing and end of cell. Hind tibiae with two pairs of spurs.”
(*Watson, l. c.*)

Hesperia maculata. (Plate XLI. fig. 2, ♂.)

Syrichthos maculatus, Bremer & Grey, Schmett. N. China's, p. 11, pl. iii. fig. 6 (1853);

Pryer, Rhop. Nihon. p. 35, pl. x. fig. 21 (1889).

Pyrgus maculatus, Ménétriciés, Cat. Mus. Petr. pl. v. fig. 5 (1855).

“Alis supra: nigrescentibus, anticis fasciis duabus interruptis et lunula mediana alba; posticis punctis albis biserialibus; subtus anticis iisdem ut supra, attenuæ apice castaneo; posticis castaneo alboque fasciatis.

“Expans. alar. antie. unc. 1½.” (*Bremer & Grey, l. c.*)

The larva, which Graeser found commonly in September enclosed between leaves of raspberry and *Spirea*, is of a uniformly light green with a few short white hairs, the second segment and first pair of legs are red-brown, and the other legs are light green with black claws; head round and velvety black. The pupa is dusted with bluish white.

This species, which was described from a Peking specimen, occurs in Western China at Chia-ting-fu; at Ichang, Chang-yang, and Kiukiang in Central China; and in Japan.

Maculata can easily be separated from *H. zona* by the following characters:—The ground-colour is blacker, the maculation more prominent, and the fringes are more distinctly chequered. On the secondaries there are always two bands of spots, the outer of which is often very well defined and angulated. In *H. zona* this second band is occasionally faintly indicated. On the under surface the apex of primaries and disc of secondaries are brightly marked with castaneous, whereas in *H. zona* the colour is more olive and there is a dark submarginal band on secondaries which is not found in *H. maculata*.

In my paper on the “Butterflies of Japan and Corea” (Proc. Zool. Soc. Lond. 1887). I erroneously included *Pyrgus sinicus*, Butler, as a synonym of *H. maculata*, and I regret to find that Staudinger (Rom. sur Lép. vi. p. 217) has perpetuated this error. His remarks on what he considers to be the

typical form of *H. maculata* clearly indicate that he had '*P. sinicus*' = *H. zona* under observation, and his description of *maculata*, var. *amurensis*, really refers to typical *H. maculata*.

My examples from Amurland do not differ from Chinese or Japanese specimens, nor from specimens taken in the Tetung Mountains, Thibet, which were sent to me by M. Grun-Grshimailo.

Distribution. North, Central, and Western China, Japan, Amurland, and Thibet.

Hesperia zona. (Plate XII. figs. 1, 3, vars.)

Scelothrix zona, Mabille, Ann. Soc. Ent. Fr. 1875, p. cxxiv.

Scelothrix (Pyrgus) albistriga, Mabille, Ann. Soc. Ent. Fr. 1876, p. xxvii.

Pyrgus sinicus, Butler, Ann. & Mag. Nat. Hist. (4) xix. p. 96 (1877).

Syrichthus sinicus, Pryer, Rhop. Nihon. p. 35, pl. x. fig. 22 (1889).

- “Subsimilis *S. maculato*, Brem., alis fusco-nigris; anticis cum duabus lineis punctorum alborum, altera in disco 4 puncta preferens, quorum duo superiora geminata; eorum alterum ad costam minimum, alterum in cellula majus cum macula nigra antierius albo circumdata junctum; altera autem linea novem punctorum, quorum medium minus. Alis posticis concoloribus cum 2 maculis albis elongatis in media ala. Fimbria alba vix intersecta. Alis anticis subtus concoloribus margine albescenti, basi et costae dimidio eincrescentibus. Posticis basi usque ad medium albescenti cum macula punctum album parvum claudenti ad marginem superiorem; zona nigra margini exteriori parallela vel fascia sat lata. Margo ipse griseus. In disco fascia alba fere translucida puncta paginae superioris referens.
“Ex Asia centrali ad orientem; Peking?” (*Mabille, l. c.*)

Var. **albistriga**, Mabille. (Plate XII. fig. 1, ♂.) “Simillimus *S. zona*, P. Mab., et *S. maculato*, Brem., sed paulo minor; in alis posticis ad basim tria puncta alba vel interdum quatuor. Subtus alae omnes fuscae, interiores zona alba ad costam interrupta divisae et puncto albo signatae ad costam proxime basim; basis inferiorum et costa superiorum ad basim eincrescunt.

- “Ex Asia orientali.” (*Mabille, l. c.*)

P. sinicus, Butler.—“Allied to *P. maculatus*: primaries the same; secondaries above with the central transverse interrupted streak composed of only three well-separated white spots, the outer or discal series of five spots all small; secondaries below very different from *P. maculatus*, sordid white; a rather broad olive-brown band, shorter than the darker band of *P. maculatus*, and crossed by white veins, indistinctly bordered with white internally, and broadly white-bordered externally; the interno-median, first median, and discoidal interspaces irrorated with the same brown (beyond the white border); external area broadly brown, its inner half blackish; no trace of the angulated submarginal white streak common to *P. maculatus*: fringe white, spotted with brown. Expanse of wings 1 inch 3 lines.” (*Butler, l. c.*)

This species is common in Central and Southern Japan and at Gensan in

the Corea. It also occurs in Central China at Chang-yang and Kiukiang, and in Western China at Chia-ting-fu.

I have beautifully executed drawings of the types of *zona* and *albistriga*, Mabille, and consider that both, together with *sinicus*, Butler, are referable to one species. *Zona=sinicus* is the usual form met with, and has the dark submarginal band on under surface of secondaries well developed; var. *albistriga* is a slightly smaller form, in which the ground-colour of under surface is more uniform in tint and the black submarginal band does not extend far beyond the anal angle. In some specimens the dark central band on under surface of secondaries is entirely obliterated as in fig. 3.

Hesperia thibetana.

Syrichthys maculatus, var. *thibetanus*, Oberthür, Etud. d'Entom. xv. p. 20, pl. iii. fig. 27 (1891).

Very similar to *H. maculata* on the upper surface, but the white spots are generally rather smaller and the outer band of spots on secondaries is not elbowed. On the under surface the apex of primaries is white enclosing a dash of olivaceous brown, instead of being entirely brown; the pattern on secondaries is similar to that of *maculata*, but the colour of ground and markings is the same as in *H. bieti*.

Expanse 32-36 millim.

Of this species, which M. Oberthür has considered to be a form of *H. maculata*, I have examples from Ta-chien-lu and Wa-ssu-kow in Western China, where they were taken in May and June.

Hesperia bieti.

Syrichthys bieti, Oberthür, Etud. d'Entom. xi. p. 26, pl. vi. fig. 50 (1886).

"Voisin de *maculatus* dont il diffère peu en dessus, mais très distinct en dessous par les dessins gris jaunâtre de ses ailes inférieures.

"Le dessous de l'abdomen est blanchâtre." (*Oberthür, l. c.*)

This species is fairly plentiful at Ta-chien-lu and Wa-ssu-kow, Western China, in May and June.

Alphéraky* records *S. bieti* from Tangout, plateau of Amdo. M. Grun-Girshimailo sent me a specimen as this species from the Nian-shan mountains, Thibet; but it is quite different to any *Hesperia* with which I am acquainted, and will probably prove to be new.

* Rom. sur Léop. v. p. 122.

Hesperia oberthuri. (Plate XLI. fig. 5, ♂.)

Syrichthos oberthuri, Lecch, Entomologist, xxiv., Suppl. p. 59 (June 1891).

Syrichthos delavayi, Oberthür, Etud. d'Entom. xv. p. 20 (July nce June, 1891).

Closely allied to *Hesperia maculata*, Brem., with which it agrees almost exactly in colour and ornamentation of upper surface, but the outer macular band is less angulated. The under surface of secondaries is olive-green or grey, with white basal and central bands formed of connected spots, which in the central series are of various shapes—one of these below costa is bar-shaped: between the bands the costa is white, with a round spot below of the same colour: the submarginal line is also white, waved, and interrupted.

Expanse 33-35 millim.

“ En effet ses caractères distinctifs consistent dans l'accentuation des taches blanches en dessus, dans un seul changement, quant à la disposition générale de ces taches qui sont en série plus droite et moins échelonnée; et en dessous dans l'accentuation également plus grande de tous les dessins et taches qui sont plus nets, avec des contours très arrêtés et comme circonserits par un trait noirâtre extrêmement fin. La couleur générale des taches en dessous est grisâtre, sans tendance au rougeâtre, comme cela se remarque dans le *bieti* du Yunnan.” (*Oberthür, l. c.*)

A good series from Wa-ssu-kow, taken at an elevation of 5000 feet in May and June.

M. Oberthür considers this to be a local form of *S. bieti*, but both species occur together at Wa-ssu-kow. *Oberthuri* may be distinguished from *bieti* by its brown rather than black coloration, and by the more complete, curved, and more angulated bands of secondaries; the under surface also exhibits important differences.

Hesperia alveus.

Papilio alveus, Hübner, Eur. Schmett. i. figs. 461-463 (1798-1803).

Hesperia alveus, Rambur, Faun. And. pl. viii. fig. 111 (1839).

Syrichthos alveus, Laug, Butt. Eur. p. 341, pl. lxxix. fig. 1 (1881).

“ Expands from 1 to 1.10 in. Brown. Fore wings with a white discal spot and a submarginal row; there is a small white dot near the centre of the inner margin and the usual tripartite costal spot. Hind wings as in *corthomi*, but even less distinctly marked; fringes brown and white. Underside: fore wings grey with white spots, as above, but suffused; hind margin brownish or greenish. Hind wing white, with central and submarginal greenish bands, irregular in shape; there is a basal spot of the same colour as the bands.” (*Laug, l. c.*)

This appears to be a scarce species in China. I received three specimens from How-kow, where they were taken at an elevation of 10,000 feet. M. Grun-Grshimailo sent me a specimen from Koko-noor which agrees exactly with these examples, and I have individuals in my European series

of *H. alveus* which also agree with them. M. Grun-Grshimailo has described this form as '*Pyrgus' alveus*, var. *sifanicus* *.

Graeser met with the species commonly at Pokrofska in June, and Staudinger records var. *frutillum*, Hübner, from Minussinsk, Saissan, and Lepsa in North-central Asia.

Distribution. Central Europe, Spain, Italy, South Russia, Asia Minor, Syria, Armenia, Persia, Amurland, Central Asia, Western China.

Genus THANAOS.

Thanaos, Boisduval, Icones, 210 (1832-33); Watson, Proc. Zool. Soc. Lond. 1893, p. 69. Type, *tages*, Linn.

"Antennæ: club moderate, more or less bent into a curve, bluntly pointed. Palpi porrect: second joint laxly clothed; third joint almost concealed, bluntly conical. Fore wing: inner margin longer than outer margin: male with a costal fold: cell of fore wing less than two-thirds the length of costa; discocellulars slightly inwardly oblique, the lower the longer: vein 3 shortly before the end of cell: vein 2 slightly nearer to base of wing than to end of cell. Hind wing: outer margin evenly rounded; vein 7 very close to end of cell; discocellulars and vein 5 faint; vein 3 immediately before end of cell; vein 2 almost equidistant from end of cell and base of wing. Hind tibiæ fringed and with two pairs of spines, the upper pair minute.

"This genus as it stands at present includes many species which are certainly not congeneric. The above description is taken from the type species.

"Found in Europe and North America." (*Watson, l. c.*)

Thanaos montanus. (Plate XLII. fig. 2, var.)

Pyrgus montanus, Bremer, Bull. Acad. Petr. iii. p. 473 (1861); Lep. Ost-Sib. p. 31, pl. ii. fig. 4 (1861).

Nisoniades montanus, Pryor, Rhop. Nihon. p. 35, pl. x. fig. 23 (1889).

Thanaos rusticans, Butler, Journ. Linn. Soc., Zool. ix. p. 58 (1866).

"Alæ antice supra griseo-olivaceæ, maculi basali, fasciis duabus obliquis (interiore sæpe interrupta et obsoleta, exteriori sinuato-dentata) lunulisque marginalibus, seriatiim dispositis, olivaceo-fuscis; punctis marginis anterioris tribus albidis; postice nigro-fuscæ lunula vel striga media, maculis serici externæ flexuosæ sericique marginalis flavis.

"Alæ antice subtus nigro-fuscæ, seriæbus macularum flavarum tribus; postice subtus sicut supra. 34-37 m." (*Bremer, l. c.*)

"Alis supra et subtus dilatioribus, maculis minoribus." (Gr.-Gr. Hor. Soc. Ent. Ross. 1891. p. 159.)

T. rusticus. Butler.—“Alae antice supra basi cinereo-fuscae, lunula nigra apud basin cella inclusa, fascia media extus ochreo-pallido intus olivaceo-fusca lineis nigris marginata et divisa, area apicali cinereo-fusca fasciis olivaceo-fuscis variegata, linea submarginali lunulata pallida; posticæ nigro-fuscae, macula media oblonga brevi ochrea macularumque seriebus duabus submarginalium. Corpus nigro-fuscum.

“Alae antice subtus basi fuscæscentes, fasciis duabus fuscis obsolete post cellam positæ et apud marginem anteriorem conjunctis, margine postico linea fusca lunulata submarginata: posticæ velut supra. Corpus fuscum.

“Alar. exp. unc. $1\frac{1}{5}$.” (Butler, *l. c.*)

Pryer states that the larva feeds upon oak.

Common in most parts of Japan in May. I also took it at Ningpo in April, and Pratt met with it at Ichang, Central China. It is fairly plentiful in Amurland and Fixsen records it from Corea.

The only localities in Western China from which I have received specimens are Wa-ssu-kow and Ta-chien-lu, where it occurs in May and June. The specimens from these places are smaller and darker than the type, and the inner edge of the central band of primaries is not indented; the yellow spots on secondaries are smaller, not always well defined, and in one specimen almost entirely obscured by the dark ground-colour. This form may be known as var. *nigrescens* (Plate XLII. fig. 2, ♂).

Thanaos pelias. (Plate XLII. fig. 3, ♂.)

Nisoniades pelias, Lecch, Entomologist, xxiv., Suppl. p. 60 (June 1891).

Nisoniades erebus, Grun-Grshimailo, Horæ Soc. Ent. Ross. xxv. p. 461 (1891).

Primaries grey, the basal half thickly, and the outer half sparingly, sprinkled with blackish; there are three transverse black lines, the first is not well defined, the second is slightly curved and indented, and the third is serrated; the space between the second and third lines appears to be darker, and there is a white spot on the costa. Secondaries fuliginous, with faint indications of a pale transverse line beyond the centre of the wing. Under surface fuliginous; the primaries have a short white macular band from the costa, and the apices are tinged with grey; transverse band on secondaries indicated as above. Fringes dark grey, paler towards extremities.

Expanse, ♂ 36 millim., ♀ 40 millim.

Agrees with *T. marloji*, Boisd., in size and in the abbreviated band on the under surface of primaries, but on the upper surface the markings are not very dissimilar to those of *T. tages*, L.

Var. *erebus*, Grun-Grshimailo. “Supra alis anticis cinereo-griseis, basin versus obscurioribus et fusco mixtis, litura marginali cinerea, ad discum obscurius adumbrata, duabus fasciis transversis obscure griseis, nigro serrato-marginatis; posticis nigro-fuscis.

"Subtus alis nigro-fuscis, anticis costa apiceque griseo-atomatis, punctis tribus subcostalibus minusculis albis ornatis. Fimbria obscure grisea. ♂ ♀ 15-16 mm." (*Gr.-Gr., l. c.*)

M. Grum-Grshimailo sent me specimens of his '*N. erebus*' from Nian-shan; they are smaller than the majority of the specimens of *T. pelias* and rather paler and browner in colour. In markings, however, they are identical, and, seeing how very trifling the differences are, the Nian-shan examples seem hardly worthy of a varietal name, unless it should be ultimately found that no intermediate forms occur.

T. pelias is not uncommon at Ta-chien-lu and Wa-ssu-kow in the months of June and July.

Genus ISOTEINON.

Isoteinon, Felder, Wien. ent. Mon. vi. p. 30 (1862); Watson, Proc. Zool. Soc. Lond. 1893, p. 83. Type, *lamprospilus*, Felder.

"Genus *Cyclopidi*, Hüb., Led., accedens, antennis multo longioribus, fere ut in *Pterogospicis* clavatis abdomineque alas posticas hand superante præsertim discrepat." (*Felder, l. c.*)

"Antennæ: club moderate, elongated, terminal crook short, tip acuminate. Palpi: second joint densely clothed with short scales; *third joint erect*, reaching well above the vertex of the head, slender, obtusely conical. Fore wing: inner margin considerably longer than outer margin; cell less than two thirds the length of the costa; discocellulars erect; vein 5 slightly nearer to 4 than to 6; vein 3 close to end of cell; vein 2 about equidistant from end of cell and base of wing in the male, considerably nearer to base of wing in the female. Hind wing narrow: vein 7 shortly before end of cell; discocellulars and vein 5 faint, but distinctly traceable: vein 3 immediately before end of cell. Hind tibiæ sparsely clothed with hairs and with two pairs of spurs. No secondary sexual characters on the wings.

"Many Indian species have been put into this genus; none of those, however, which I have been able to examine belong to it, the direction of the third joint of the palpi alone readily distinguishing them. This genus appears to be allied to *Hyarotis*, Moore.

"*Habitat.* China and Japan." (*Watson, l. c.*)

Isoteinon lamprospilus.

Isoteinon lamprospilus, Felder, Wien. ent. Mon. vi. p. 30 (1862).

Pamphila vitrea, Murray, Ent. Mo. Mag. xi. p. 171 (1875).

Pamphila lamprospilus, Pryer, Rhop. Nihon. p. 33, pl. x. fig. 8 (1889).

"Alis albido ciliatis, linea marginali ochracea, omnibus supra fuscis, anticis utrinque maculis tribus discalibus punctisque totidem connatis subapicalibus hyalino-albis, macula interiore argenteo-alba, subtus anticarum limbo costali posticarumque pagina tota ochraceo-brunnes-

centi atomatis, his maculis novem albis, nitidis, fusco cinctis, abdomine, regione dorsali excepta, ochraceo-annulato. ♂.

"Prope Ning-po captus est.—Magnitudinem habet *I. pygmaea*, Fabr., indici, quem olim * in genus nostrum *Astictopteron* venis et abdomine multo brevioris sat discrepantem locavimus, staturam autem multo robustiorem." (*Felder, l. c.*)

"Alis suprâ brunneis, basin versus (praesertim posticis) fusco-pilosis, anticis macula sub-apicali pellucida tripartita, macula discoocellulari pellucida super alteram magnam quadratam, macula pallide albo-flavescente subopaea in venam sub medianam, maculaque pellucida minore inter ramos medianos superiores. Posticis immaculatis.

"Subtus alis anticis brunneis, costa apiceque ochraceis, maculis ut in pagina superiore, strigaque pellucida obliquâ maculas quadratam sub-medianamque attingente. Posticis ochraceis, maculis novem albis brunneo-marginatis, conspicuis. Ciliis albis.

"Alar. exp., l" 7'''.

"Hab. Japoniam.

"A distinct and well-marked species." (*Murray, l. c.*)

I found this species fairly plentiful in July at Tsuruga, on the west coast of Japan. Fryer says it is common about Yokohama. My collectors obtained specimens in Central China at Chang-yang and Ichang, and at Moupin, Wa-sso-kow, and Pu-tsu-fong in Western China. I also received an example from Kiushiu, Southern Japan, where it was captured by a native collector.

Genus HETEROPTERUS.

Heteropterus, Dum. Zool. Anal. p. 271 (1806); Watson, Proc. Zool. Soc. Lond. 1893, p. 89. Type, *morpheus*, Pall.

"Antennae short, less than half the length of costa; club moderate, straight, elongated, blunt. Palpi porrect, densely clothed with laxly set scales, almost concealing the third joint, which is short, slender, and bluntly conical. Fore wing: inner margin longer than outer margin; cell less than two thirds the length of costa: vein 12 reaching costa before the end of cell; upper discoocellular short but distinct; middle discoocellular longer than lower; vein 5 slightly nearer to 4 than to 6; vein 3 shortly before end of cell; vein 2 more than twice as far from end of cell as from base of wing. Hind wing: outer margin even; vein 7 well before end of cell; discoocellulars and vein 5 barely traceable; vein 3 well before end of cell, more than twice as far from 2 as from 4; vein 2 nearer to base of wing than to end of cell. No epiphysis on fore tibiae. Hind tibiae almost naked; in *morpheus* with two pairs of spurs, in *ornatus* only with terminal pair. Abdomen reaching beyond the anal angle of hind wings." (*Watson, l. c.*)

Heteropterus morpheus.

Papilio morpheus, Pallas, Reise, i. p. 171 (1771).

Papilio steropes, Wien. Verz. p. 160 (1776); Esp. Schmett. i. 1, pl. xli. fig. 1 (1778?).

* Wiener entom. Monatschrift, iv. p. 401.

Heteropterus morpheus, Kirby, Cat. Diurn. Lep. p. 623 (1871).

Cyclopides morpheus, Lang, Butt. Eur. p. 355, pl. lxxxii. fig. 4 (1884).

"Expands from 1.30 to 1.45 inch. All the wings are uniform dark brown. The fore wings have a light yellow or yellowish-white spot on the costa, and below it another less distinct; there are three indistinct light spots near the apex. The hind wings are uniformly dark brown: the fringes are whitish, that of the fore wings indistinctly spotted with brown. Underside: fore wings dark brown, with a marginal row of small yellow crescentic spots, and one or two other yellow spots near the apex. Hind wings yellow, with a submarginal row of seven large oval white spots bordered with black; these spots form a continuous band; between these and the base are five more similar spots, but detached; there are three central and two basal spots. The sexes are similar in coloration and pattern, except that the female sometimes has an extra yellow spot on the costa of the fore wings above.

"*Larva*.—Light green, with a darker dorsal line; lateral lines yellowish white. Feeds on grasses in May and June." (*Lang, l. c.*)

I found this species common in Gensan in June; the specimens agree very well with those from Europe. Herz also found it commonly in Corea; it is plentiful in Amurland and Staudinger records it from N. China.

Distribution. Central Europe, Livonia, N. Italy, Central and South Russia, Armenia, Siberia, Amurland, Corea, N. China.

Heteropterus unicolor.

Steropes unicolor, Bremer & Grey, Schmett. N. China's, p. 10, pl. iii. fig. 3 (1853).

Cyclopides ornatus, Bremer, Bull. Acad. Petr. iii. p. 473 (1861); Lep. Ost-Sib. p. 33, pl. ii. fig. 5 (1861); Pryer, Rhop. Nihon. p. 35, pl. x. fig. 19 (1889).

"Alis supra: fuscis; subtus: anticis fuscis, apice costaque fulvis; posticis fulvis.

"Expans. alar. antic. unc. $1\frac{1}{2}$." (*Bremer & Grey, l. c.*)

Var. *ornatus*, Bremer. "Alæ supra nigro-fusca, ciliis ochraceo-griseis.

"Alæ anticæ subtus nigrae margine anteriore, apice margineque posteriore ochraceis; posticæ ochraceæ striga recta argentea a basi ad marginem posteriorem ducta; margine interiore sæpe argenteo-micanti. 27-31 m." (*Bremer, l. c.*)

This species is common in Japan, Corea, Amurland, and N. China. I have specimens of both forms from Chang-yang, Central China, where they were taken in July and August. Fixsen records both forms and also intermediates from the Corea. Staudinger states that *ornatus* is the only form which has so far been met with in Amurland, and adds that he has a specimen of the *unicolor* form from Japan. Elwes also records intermediates from Japan.

Genus PAMPHILA.

Pamphila, Fabricius, Illiger's Magazin, vi. p. 287 (1807); Watson, Proc. Zool. Soc. Lond. 1893, p. 89. Type, *palemon*, Pall.

Steropes, Boisduval, Voy. Astrolabe, Léop. p. 167 (1832). Nom. præoc.

Carterocephalus, Lederer, Verh. zool.-bot. Ges. Wien, ii. pp. 26, 19. Type, *palemon*, Pall.

- "Antennæ short, not half the length of costa; club stout, elongate, blunt. Palpi porrect, densely clothed with laxly set scales almost concealing the third joint, which is short, slender, and bluntly conical. Fore wing: inner margin considerably longer than outer margin; cell less than two thirds the length of costa: vein 12 reaching costa before the end of cell; upper discocellular short but distinct, outwardly oblique; middle discocellular slightly longer than lower; vein 5 slightly nearer to 4 than to 6; vein 3 very close to end of cell; vein 2 almost equidistant from base of wing and end of cell. Hind wing: outer margin even; cell very long, reaching more than half across wing; vein 7 shortly before end of cell; discocellulars and vein 5 barely traceable; vein 3 immediately before end of cell; vein 2 considerably nearer to end of cell than to base of wing. No epiphysis on fore tibiae. Hind tibiae slightly fringed, and with only terminal pair of spurs.
- "*Distribution*. Holarctic." (Watson, l. c.)

Mr. Watson adds that although six or seven hundred species have been described in this genus, probably only about five of them correctly belong to it. The remainder include species belonging to almost every described genus.

***Pamphila argyrostigma*.**

Carterocephalus argyrostigma, Eversmann, Bull. Mosc. 1851, ii. p. 624; Lang, Butt. Eur. p. 360 (1884); Alphéraky, Rom. sur Léop. v. p. 123 (1889).

- "Slightly smaller than *C. palemon*. Wings brownish black. Fore wings with three large yellow spots touching the costa, reaching to the centre of the wing and decreasing in size towards the base; below these and alternating with them so as to produce a chequered pattern are two similar spots touching the inner margin. Hind wings with three small yellowish-ochreous spots near the hind margin and a continuous band of smaller spots towards the base. Underside: fore wings as above, but the ochreous spots are larger. Hind wings reddish brown, with two large central silver spots and some smaller ones near the base and the hind margin. Marginal fringes orange; head and collar yellowish orange; thorax dark brown; abdomen black, with an orange anal tuft." (Lang, l. c.)

Alphéraky records a specimen taken in the province of Kan-sou, N.W. China. The type of this species came from Kiachta. Graeser met with it at Pokrofska at the beginning of June, and it has been found also in other parts of Amurland and Trans-Baikal. M. Grun-Grshimailo sent me a specimen from the Tetung Mountains in E. Thibet. My collectors failed to meet with it in China.

Pamphila pulchra. (Plate XL. fig. 20, ♂.)

Pamphila pulchra, Lecch, Entomologist, xxxiv., Suppl. p. 59 (June 1891).

Carterocephalus ops, Grun-Grshimailo, Horv. Soc. Ent. Ross. xxv. p. 460 (1891).

Male. Fuscous. Primaries have some yellowish scales on the basal and outer marginal areas, and are traversed by two pale yellow macular bands; the initial spot of outer band is somewhat lunular, and is placed inwards on the costa. The secondaries have three pale yellow spots on the central area, but the first of these lies towards outer angle; there is a smaller yellow spot towards the base of the wing, and some indications of a pale yellow submarginal band. The under surface is brownish; primaries have the bands as above, but the space between them is clouded with blackish, and the basal half of the wing is washed with pale ochreous; secondaries are suffused with pale ochreous along the costal area, and have a silvery longitudinal central streak, which is interrupted about the middle, and its outer portion expands into an irregular-shaped blotch; there is a round silvery spot above the blotch, another below it, and a short club-shaped streak before the abdominal margin; a conspicuous fuscous spot lies above the central streak, and there are three or four silvery spots towards anal angle, representing a submarginal band; marginal line silvery grey. Fringes of primaries fuscous, faintly chequered with grey-brown, and preceded by a black line; those of the secondaries are grey-brown, paler towards extremities.

Expanse 29 millim.

In the ornamentation of the under surface of secondaries this species is something like *Pamphila avanti*, de Nicéville (Jour. Asiat. Soc. Beng. lv. p. 255, pl. xi. fig. 10), but in other respects it is very different, and quite unlike any other species with which I am acquainted.

Occurs in June and July at Ta-chien-lu and Wa-ssu-kow, Western China, and M. Grun-Grshimailo records it from the Tetung Mountains under the name *Carterocephalus ops*.

Pamphila houangty.

Carterocephalus houangty, Oberthür, Etud. d'Entom. xi. p. 27, pl. v. fig. 5 (1886).

"Espèce voisine du *sylyvius*, mais d'un jaune plus foncé en dessus. Les taches noires sont plus épaisses; elles ont cependant à peu près la même disposition que dans *sylyvius*. Les caractères différentiels saillants se trouvent principalement aux ailes intérieures en dessous.

"J'ai fait représenter un male. La femelle diffère du male de la même façon que chez *sylyvius*." (Oberthür, l. c.)

Appears to be a common species in Western China at Ta-chien-lu, Wa-ssu-kow, Ni-tou, Che-tou, and How-kow.

The males are always more abundant than the females.

Pamphila abax.

Carterocephalus abax, Oberthür, Etud. d'Entom. xi, p. 27, pl. v, fig. 27 (1886).

- "Ailes brun noir, frangées de jaune d'or, surtout aux inférieures et marquées de taches jaune d'or, au nombre de cinq, sur les supérieures, de forme assez rectangulaire; l'une d'elles est jointe par un trait nervural à la base; et au nombre de quatre sur les inférieures, de forme assez arrondie, l'une dans l'espace cellulaire et les trois autres alignées en dessous de celle-ci, comprenant deux grosses et une petite, celle qui est plus près du bord anal.
- "Le dessous diffère du dessus, parce que les ailes inférieures sont saupoudrées de gris verdâtre et de jaunâtre. L'abdomen est gris jaunâtre eu dessous avec l'extrémité anale jaune. Les pattes sont jaunes; les antennes sont finement annelées de jaune et ont la massue jaune.
- "Mgr. Biet a recueilli trois exemplaires du *Carterocephalus abax* à Ta-Tsien-Lou." (Oberthür, l. c.)

Female agrees with the male in colour and pattern.

The female seems to be exceedingly rare. M. Oberthür does not mention it, and although I have received over a hundred specimens of the species, I have only been able to detect one example of this sex.

A common species in Western China, occurring at Ta-chieu-lu, Omei-shan, Ni-tou, Moupin, and Che-tou.

Pamphila flavomaculata.

Carterocephalus flavomaculatus, Oberthür, Etud. d'Entom. xi, p. 27, pl. ii, fig. 9 (1886).

Fulginous brown. Primaries have a small subbasal yellow spot, two yellow spots about the centre of the wing, and four towards the yellow-tipped apex; fringes of the ground-colour tinged with yellowish. Secondaries have two yellow central spots, the upper one transversely elongate; fringes yellowish grey. Under surface olivaceous brown: primaries have a whitish subbasal spot and two yellow-tinged ones in the centre, followed by an ill-defined transverse series of dots; there are four or five yellow-tinged spots on apical area, which is suffused with yellowish grey, as also is the costa; marginal spots and fringes yellowish grey; secondaries have some short yellowish-grey streaks on basal and submarginal areas, and nine silvery spots placed as follows—one subbasal, five forming a central series, of which the costal pair are confluent and the third transversely elongate, submarginal series represented by a small round spot at anal angle, a larger one below it, and two round ones in the median interspaces; marginal spots yellowish grey, confluent towards costa; fringes yellowish grey; brownish at base. Antennae black, finely ringed with yellowish, and the underside of the club is also yellowish. Sexes agree in colour and marking.

Expanse 30-32 millim.

Occurs at Ta-chien-lu and Wa-ssu-kow.

This species agrees almost exactly with *P. niveomaculata* in the shape and position of the markings, but the spots are rather smaller, and together with the fringes of secondaries are yellow instead of white.

Pamphila niveomaculata.

Carterocephalus niveomaculatus, Oberthür, Etud. d'Entom. xi. p. 27, pl. ii. fig. 8 (1886).

Carterocephalus christophi, Grun-Grshimailo, Horæ Soc. Ent. Ross. xxv. p. 460 (1891).

Velvety black. Primaries have three white central spots, the third much smaller than other two, and five subapical ones, the fifth hardly discernible; fringes black except at the apex, where they are white. Secondaries have two white central spots similar in shape to those of *P. flavomaculata*; fringes white. Under surface of primaries blackish, washed with olivaceous along costa and on apical area: the white spots of upper surface are reproduced, and there are two additional pale spots below apex, and some ill-defined ones precede and follow the central spots; secondaries olivaceous, marked with white at base of costa and inner margin; there are nine silvery spots placed as follows—one subbasal, five forming a central band, two at outer angle, the upper not clearly defined, and one in each median interspace towards outer margin; a short white streak is placed between central band and lower spot of the two at outer angle; fringes white. Antennæ black, finely ringed with white beneath, underside of club is also white. The sexes are alike in colour and marking.

Expansion 32 millim.

Occurs at Ta-chien-lu and Wa-ssu-kow.

Var. **christophi**, Grun-Grshimailo.

This form, which occurs in the Amdo plateau, Thibet, differs from the type on upper surface in having rather more white at apex of primaries and a white patch at base of these wings; the central spots on secondaries are confluent and form a large patch.

Pamphila gemmata. (Plate XII. fig. 18, ♀.)

Carterocephalus gemmatus, Lecch, Entomologist, xxiv., Suppl. p. 59 (June 1891).

Carterocephalus demea, Oberthür, Etud. d'Entom. xv. p. 19, pl. iii. fig. 24 (July nec June, 1891).

Allied to *P. niveomaculata*, Oberthür, but on the upper surface the primaries have a white spot at the base of the cell, another towards outer end of cell, and four smaller ones beyond, forming in conjunction with the four apical spots an interrupted band; the secondaries have one large white central spot, and in some specimens there is a smaller spot below it. The under surface of primaries is dashed with silvery white along the base of the costa, and, in addition to the spots as above, there is a silvery-white apical cloud; the secondaries have two broad silvery-white bands from costa to submedian nervule, which is dashed with the same colour, as also is the base of costa.

Expansion, ♂ 32 millim., ♀ 30 millim.

I have specimens from Ta-chien-lu, Pu-tsu-foug, and Wa-ssu-kow. The species occurs at various elevations, ranging from 5000 feet at Wa-ssu-kow up to 8000 feet at Ta-chien-lu.

I have also received examples from M. Grun-Grshimailo, who took them on the plateau of Amdo, Thibet.

Pamphila micio.

Curterocephalus micio, Oberthür, Etud. d'Entom. xv. p. 19, pl. iii. fig. 29 (1891).

- “Dessus noir, avec les taches blanches aux ailes supérieures comme suit : une petite tache cellulaire, à la naissance de la cellule ; une plus grosse à l'extrémité de la cellule ; deux également assez grosses, rectangulaires, intranervurales, liées à la tache cellulaire, au dessous de laquelle elles descendent en ligne droite vers le bord inférieur ; cinq taches petites dont trois costales, subapicales, en ligne assez droite et deux au dessous et au delà des trois premières, de telle façon que la première de ces deux est liée par l'extrémité de son angle intérieur, à l'extrémité de l'angle extérieur de la dernière des trois.
- “Aux inférieures, une grosse tache cellulaire et une autre plus petite contiguë à celle-ci.
- “Dessous des supérieures brun noir avec les mêmes taches blanches qu'en dessus et deux en plus, une très petite apicale et une autre entre les deux groupes maculaires médians. L'apex des supérieures est brun rouge.
- “Dessous des inférieures brun rouge foncé, avec une disposition de taches blanc d'argent analogue à celles de *dema*, mais de forme différente. La tache submarginale notamment est étroite, presque linéaire dans son parcours inférieur ; l'autre décrit intérieurement une courbe assez régulière et forme intérieurement une pointe qui va joindre la tache submarginale.” (*Oberthür, l. c.*)

Differs principally from *P. nivicomaculata* in the transverse band of primaries. On the under surface it agrees better with *P. gemmata*.

My collectors failed to meet with this insect in any part of China that they visited. The type was from Tse-kou.

Genus TARACTROCERA.

Taractrocera, Butler, Cat. Lep. Fabr. p. 279 (1869) ; Watson, Proc. Zool. Soc. Lond. 1893, p. 94. Type, *merius*, Fabr.

- “Antennæ short ; club forming a flattened disc, conspicuously hollowed out, tip blunt. Palpi : second joint densely scaled ; third joint long, slender, erect, reaching above the vertex, tip acuminate. Fore wing : inner margin longer than outer margin ; cell less than two thirds the length of the costa ; vein 12 reaching costa well before the end of cell ; middle discocellular considerably longer than lower one ; vein 5 close to bottom of cell ; vein 3 well before end of cell, about twice as far from 2 as from 4 ; vein 2 slightly nearer to end of cell than to base of wing. Hind wing : outer margin even ; vein 7 very close to end of cell ; discocellulars faint ; vein 5 not traceable ; vein 3 immediately before end of cell ; vein 2 twice as far from base of wings as from end of cell. Hind tibiae with two pairs of spurs.

“This is a genus of very numerous species, which ranges from India through the Malay Archipelago to Australia, appearing to reach its greatest development in the islands of the Archipelago ; the peculiar form of the antennal club readily distinguishes it.” (*Watson, l. c.*)

Taractrocera flavoides, sp. nov. (Plate XL. figs. 10 ♀, 11 ♂.)

Male. Primaries pale fulvous, shaded with blackish on basal area; below the outer extremity of discoidal cell there is a large black spot, which is connected by a black streak with a large curved black spot on costal area; outer margin broadly bordered with black, the inner edge with a quadrate indentation towards apex. Secondaries black, with a pale fulvous subbasal spot and a broad central maculated band of the same colour extending from costal to submedian nervure, the second spot is more or less quadrate in shape, and is placed out of line with the others forming the band. Fringes pale fulvous. Under surface: primaries blackish, suffused with yellowish on apical area, and narrowly along outer margin; the costa is pale fulvous from base to beyond the middle, where it unites with a patch of the same colour in discoidal cell; beyond is a pale fulvous macular band, the second spot placed out of line with the rest; secondaries blackish suffused with yellowish except in abdominal fold; there are two transverse yellow bands; the edges of both are dentate and marked with black. Fringes yellow. In the female the yellow markings are narrower.

Expanse 2½ millim.

In general appearance this species, which so far has only occurred at Chow-pin-sa and Omei-shan, is very like *Padraona flava*, for which it might easily be overlooked. The antennæ, however are not hooked at the tip, but have spoon-shaped clubs. Its nearest ally appears to be *T. nigrolimbatus*, Snellen*, from Batavia.

Genus ADOPLEA.

Adoplea, Billb. Enum. Ins. p. 81 (1829); Watson, Proc. Zool. Soc. Lond. 1893, p. 98.

Type, *thammas*, Hufn.

Pelion, Kirby, List Brit. Rhop. (1858). Type, *thammas*, Hufn.

“Antennæ short, less than half the length of costa; club elongate, straight or slightly arcuate, tip blunt. Palpi: second joint clothed with laxly-set scales; third joint long, slender, suberect. Fore wing: inner margin longer than outer margin; cell less than two thirds the length of costa; middle discocellular more than twice as long as lower; vein 5 from close to bottom of cell: vein 3 close to end of cell; vein 2 (in both sexes) slightly nearer to base of wing than to end of cell. Hind wing: outer margin even, slightly excised at vein 2; vein 7 well before end of cell, only slightly nearer to 6 than to 8; discocellulars very faint, vein 5 not traceable; vein 3 immediately before end of cell; vein 2 more than twice as far from base of wing as from end of cell. Hind tibiae with two pairs of spurs. Abdomen slender, extending beyond anal angle of hind wings.

“Male with a linear discal stigma on the fore wing, in two portions—the upper portion long, lying below the inner margin of cell, from the origin of vein 3 to as far as vein 2; the lower portion short, in continuation of the upper portion, from below vein 2 to not quite as far as vein 1.

“*Distribution*. Holarctic.” (*Watson, l. c.*)

* Tijds. v. Entom. xix. p. 165. pl. vii. fig. 5 (1876).

Adopæa sylvatica. (Plate XL. figs. 5 ♂, 8, var. ♀.)

Pamphila sylvatica, Bremer, Bull. Acad. Petri. iii. p. 171 (1861); Lep. Ost-Sib. p. 31. pl. iii. fig. 10 (1864).

"Alæ supra ochraceæ late fusco-marginatæ, nervis fuscis; anticæ macula mediâ fusca.

"Alæ subtus ochraceæ nervis fuscis, ad basim fuscæscentes; anticæ macula obsoleta apud angulum interiorem fuscæscenti. 26 m." (*Bremer, l. c.*)

I met with this species at Gensan, Corea, in June, and at Hakodate, Japan, in August. Staudinger (Rom. sur Lép. vi. p. 210) states that Japanese examples do not differ from those from Corea.

The female only differs from the male in being larger.

The form of *A. sylvatica* occurring in Western China is so uniformly different that I describe it as

Var. **occidentalis**, var. nov. (Plate XL. fig. 8 ♀.) *Male* agrees in coloration with typical *A. sylvatica*, but the wings are more suffused with darker scales.

Female. Ground-colour almost black, the pale fulvous markings being much reduced in size, and the central series of primaries is much straighter towards inner margin; the under surface is more suffused, especially the secondaries, which have indications of a central series of pale spots.

This form occurs at Ta-chien-lu and Chia-kou-ho.

Adopæa tenebrosa, sp. nov. (Plate XL. figs. 6 ♂, 9 ♀.)

Male. Upper surface brownish black, with a purplish reflection in certain lights. Primaries are streaked obliquely on the costa with pale fulvous; there are three linear fulvous spots and one round one, forming an outwardly oblique series from the costa, and five larger pale-fulvous spots and dashes, forming an inwardly oblique series to inner margin: two contiguous-pale fulvous bars at end of discoidal cell. Secondaries clothed with olivaceous hairs on basal area; central area traversed by a series of pale fulvous elongated spots. Under surface deep fulvous; neuration of all the wings strongly marked with black; there is a black cloud towards outer angle of primaries, and the basal area is also suffused with black; the discoidal cell is closed by a black bar, and there is a black oblique streak above it running in the direction of the apex of the wing; secondaries slightly suffused with greenish-grey scales, especially along the abdominal fold; in some specimens there are indications of the pale fulvous central spots of upper surface.

Female. Similar to the male, but rather darker on the under surface.

I was disposed to consider this species to be a form of *A. sylvatica*, but it can readily be separated by the purplish reflection of the ground-colour, by the neuration on under surface being more broadly black, and by the black oblique streak from upper angle of the discoidal cell; the fulvous markings are also much paler.

I have only received this insect from Kiukiang, Central China, where Pratt met with it commonly in June and July.

Adopæa nervulata. (Plate XL. fig. 3, ♂.)

Pomphila nervulata, Mabille, Ann. Soc. Ent. France, 1876, p. lvi.

- “Mas alis anticis nitide flavis, posticis obscurioribus, nigro circumdati, nervis omnibus nigro scriptis, striga anticarum sexuali nigra, filiformi; cellula striga supradieta, nervula, et nervo, omnibus nigris clausa. Subtus alæ pallidiores sunt; margo internus anticarum albescit, et nisi ad hanc angulum, nusquam alæ nigro circumdate, basis anticarum nigra, et nervi nitide scripta.
- “Femina obscurior; latius alæ nigro-circumdate, ante cellulam umbra nigra, triangularis, et loco strigæ, macula oblonga, nigra.
- “Moupin (Abb. Arm. David), Mus. Nat. Peking.” (*Mabille, l. c.*)

Although closely allied to *A. sylvatica*, Bremer *A. nervulata* differs in being smaller and broader in the wing; the discoidal cell of primaries is not traversed by a heavily scaled longitudinal line, and the outer marginal borders are much narrower.

It does not appear to be a common species. I have only received a dozen specimens, which were taken in June and July at Moupin, Ta-chien-lu, and Wa-ssu-kow.

Adopæa leonina. (Plate XL. figs. 1 ♂, 2 ♀, 4 & 7 vars.)

Pomphila leonina, Butler, Cist. Entom. ii. p. 286 (1878).

Hesperia leonina, Pryer, Rhop. Nihou. p. 34, pl. x. figs. 18 ♂, 15 ♀? (1889).

Thymelicus leonina, Standinger, Rom. sur Lép. iii. p. 151, pl. viii. fig. 2, ♂ (1887); vi. p. 210 (1892).

- “Bright fulvous, with black veins and moderately broad purplish-brown outer borders (narrower than in *A. sylvatica*); primaries with a slender, oblique, linear, black band; secondaries with the basal area and abdominal border dusky; wings below clearer than above, with black veins and linear black margin; primaries with the base (excepting upon the costa and band) as above, black; legs and front of palpi yellow, hinder part of palpi and venter white.
- “Expanse of wings 1 inch 3 lines.
- “This species is allied to *P. sylvatica*, but markedly distinct; it is frequently mistaken for *P. evanta* of Brem., but (as I believe) simply because it has black veins; in the form of its wings it is totally dissimilar.” (*Butler, l. c.*)

Formerly I considered *A. leonina* to be synonymous with *A. (P.) sylvatica*, but now that I have a much larger amount of material available for examination I find that it is quite distinct. The males of *A. leonina* are much

lighter coloured than those of *A. sylvatica*, and there is a conspicuous sexual brand on primaries similar to that of *A. thamas*. The females are exceedingly like those of *A. sylvatica*, but the pale markings are more distinctly defined. On the under surface both sexes are very similar to *A. sylvatica*, but the male is distinguished by the sexual brand as above, and both sexes of this species have the brownish patch towards outer angle of primaries much smaller, and it does not extend to inner margin as in *A. sylvatica*.

Occurs in the mountainous parts of Central Japan, in Yesso, and at Gensan, in Corea. Dörries found it at Baranowka and in the district of Sutschan.

In Western China my collectors met with specimens at Wa-shan and Ta-chien-lu, which only appear to differ from Japanese examples in being slightly smaller (Plate XL fig. 4, ♂); but at Chang-yang, Central China, a remarkable form, for which I propose the varietal name *astigmata*, occurs (Plate XL fig. 7, ♂), in which the sexual brand of the male is entirely wanting. In other respects this form does not differ from the type, except in being rather more suffused with black. As I thought this insect might be the male of a distinct species, I had the genital armature prepared and mounted for microscopical examination, and find that it is identical in shape and structure with that of *A. leonina* from Western China.

Distribution. Japan, Corea, Amurland, Western and Central China.

Genus ERYNNIS.

Erynnis, Schrank, Fauna Boica, ii. 1, p. 157 (1801); Watson, Proc. Zool. Soc. Lond. 1893, p. 99. Type, *comma*, Linn.

Ocytes, Scudder, Syst. Rev. p. 55 (1872). Type, *metea*, Scudd.

“Antennæ short, less than half the length of costa; club short, robust, terminal crook exceedingly minute. Palpi as in *Hylephila*. Neuration as in *Hylephila* except that vein 2 of the fore wing is much nearer to the base of the wing in the male, and vein 7 of the hind wing is slightly nearer the base of the wing in both sexes; the stigma on the fore wing is very similar to that of *Hylephila*, except that it entirely fills the angle at the bifurcation of vein 2, while in *Hylephila* the discal stigma crosses the interspace beyond the origin of vein 2.

“*Distribution.* Holarctic.” (*Watson, l. c.*)

Erynnis comma. (Plate XLI. figs. 12 & 17, vars.)

Papilio comma, Linnaeus, Syst. Nat. i. 2, p. 793 (1767).

Hesperia comma, Lang, Butt. Eur. p. 353, pl. lxxxii. fig. 2 (1881).

Pamphila florinda, Butler, Cist. Entom. ii. p. 285 (1878).

Hesperia comma, Pryer, Rhop. Nihon. p. 34, pl. x. figs. 14a ♀, 14b ♂ (1889).

“Expands from 1.20 to 1.40 in. About the size of *H. sylvanus*, but has the hind margins more inclined to concavity in outline, especially in the male. The male has the basal and discal portions of the fore wing fulvous; the hind margin and apex are dark brown; there are some square fulvous spots near the apex; the black line is very distinct, and is straighter than in *H. sylvanus*. Hind wings dark brown, with a submarginal row of fulvous spots, and a fulvous spot near the base. The female is larger than the male, and is somewhat variable as regards the ground-colour, which ranges from dull fulvous to dark greenish brown; the fulvous spots are more discrete than in the male, and the black streak is absent from the fore wings. Underside: fore wings as above, but greenish towards the apex. Hind wings greenish or yellowish grey, with a submarginal row of seven or eight pure white spots, rather square in shape, and often outlined with blackish; near the base are two or three similar spots. Clubs of antennæ terminating in a hook.

“*Larva*. Olive-green. Head large and black. There are two white spots on each side of the tenth and eleventh segments. Feeds on *Coronilla*, *Oreithopus*, *Lotus*, and other Leguminosæ. in June and July.” (*Long, l. c.*)

Var. *florinda*, Butler. (Plate XLI. fig. 17. ♂.) “♂ ♀ above like *P. comma*, but deeper in colour; below altogether redder in tint, with scarcely a trace of pale spots, only two or three being indistinctly traceable in the secondaries; the veins also not tipped with black.

“Expanse of wings ♂ 1 inch 6 lines, ♀ 1 inch 5 lines.

“There is the same difference between the sexes as in the European insect, the male being tawny with purplish-brown borders and grey-streaked oblique black band, the female purplish brown with the usual straw-yellow or ochreous spots; the position of the species will be between *P. comma* and the *P. sylvanus* of Japan.” (*Butler, l. c.*)

Occurs in the central parts of Japan, and I believe also in Yesso.

Herz records typical specimens of *E. comma* from Corea, but at Gensan I only met with var. *florinda*.

E. comma seems to be a scarce insect in Amurland, and Staudinger (Rom. sur Léop. p. 211) describes a form from that region under the name *repugnans*, which he says differs principally from the type on the under surface of secondaries, where the pale spots are very small, and almost entirely obliterated by the yellow ground-colour. The males on the upper surface have much darker, almost black, outer margins; the females are hardly darker than typical *comma*.

Some specimens taken by Herz in the neighbourhood of Peking are considered by Dr. Staudinger to be near his var. *repugnans*, which I believe to be synonymous with var. *florinda*, Butler, an insect which Dr. Staudinger erroneously identifies as a form of *A. (P.) sylvanus*. I also formerly considered *florinda* to be a form of *A. sylvanus*, on account of its resemblance on the

under surface to that species; but now that I have seen a larger number of specimens, I find that *florinda* is undoubtedly a form of *E. comma*.

I have seen the type of '*Pamphila*' *mikado*, Mabille MS., and consider it to be a very worn specimen of *E. comma*, var. *florinda*, Butler.

Mr. Elwes states that specimens from Amurland seem to agree with Japanese examples.

In India *E. comma* is represented by a form which Moore has described as distinct under the name *Pamphila dimila* *. A specimen agreeing exactly with this Indian form has been received from Ta-chien-lu, Western China, by Mr. Grose Smith, and is figured in the present work (Plate XII, fig. 12, ♂). '*Pamphila*' *comma*, var. ? *lato* †, Grun-Grshimailo, from the Dshachar Mountains, is probably referable to this form.

Distribution. Europe, Amurland, Corea, Japan, N.W. Himalayas, N. & W. China.

Genus PADRAONA.

Padraona, Moore, Lep. Ceyl. i. p. 170 (1881); Watson, Proc. Zool. Soc. Lond. 1893, p. 101. Type, *mæsa*, Moore.

Antennæ: club moderate, elongate, with a short terminal crook. Palpi: second joint densely scaled; third joint short, slender, suberect, obtusely conical. Fore wing: inner margin longer than outer margin; cell less than two thirds the length of co-sta; middle discocellular about twice as long as lower; vein 5 considerably nearer to 4 than to 6; vein 3 immediately

* *Pamphila dimila*, Moore, Proc. Zool. Soc. Lond. 1874, p. 576.

† Allied to *P. comma*.

♂ *Male and Female.* Upperside testaceous; exterior border broadly fuliginous brown; apex of fore wing brownish testaceous. Cilia whitish testaceous; fore wing with a series of small yellow apical spots; male with an oblique silvery-lined black streak below the cell; hind wing with a yellow spot within the cell, and a curved discal series of four quadrate spots. Underside: fore wing pale testaceous; apical spots as above; hind wing with basal portion greenish brown; three prominent white subbasal spots disposed above, below, and at end of the cell; a curved discal series of six quadrate white spots.

Expansion, ♂ 1½, ♀ 1¾ inch. (Moore, l. c.)

† *Pamphila comma*, var. ? *lato*, Grun-Grshimailo, Horæ Soc. Ent. Ross. 1891, p. 459.

Supra alis multo obscurioribus, nigro-fuscis, basin versus fulvescentibus, maculis fulvis; subtus anticis fulvo-rubescens, ad marginem internum pallidioribus, areis basali et interna nigris, costa apiceque viridibus, maculis quinque apicalibus flavis, duabus disci dilute fulvis, extus late nigrescenti adumbratis; posticis viridibus, ad angulum analem fulvis, maculis quadrangularibus, magis a margine externo distantibus, albis. Fimbria flavida. Antennis obscurioribus.

Specimen unicum in montibus Dshachar collectum. (Grun-Grshimailo, l. c.)

before end of cell; vein 2 almost equidistant from end of cell and base of wing, slightly nearer to end of cell. Hind wing: outer margin even, slightly excised between veins 2 and 4; vein 7 well before the end of cell; discocellulars very faint, vein 5 wanting; vein 3 close to end of cell, twice as far from 2 as from 4; vein 2 considerably nearer to end of cell than to base of wing. In the males of some of the species there is a short and very inconspicuous glandular streak, situated immediately above the centre of vein 1 on the upperside of the fore wing. Hind tibiæ with two pairs of spurs.

"This genus is apparently confined to the Asiatic and Australian regions, with the exception of *coroller* from Madagascar, and *epictetus* from tropical America; these two species are possibly not correctly assigned to *Padraona*, though I am unable to point out how they can be separated from it." (*Watson, l. c.*)

Padraona dara. (Plate XL, figs. 13 & 14, vars.)

Hesperia dara, Kollar, Hüg. Kaschm. iv. 2, p. 455 (1848).

Pamphila confucius, Felder, Wien. ent. Mon. vi. p. 29 (1862).

Pamphila flava, Murray, Ent. Mo. Mag. xii. p. 4 (1875).

Hesperia dara, var. *flava*, Fixsen, Rom. sur Léop. iii. p. 318, pl. xiv. fig. 6 (1887).

Hesperia flava, Pryer, Rhop. Nihon. p. 35, pl. x. fig. 17 (1889).

"Alis supra fuscis, stria latiore costæ, fasciâ nulari obliqua maculaque subquadrata apicis anticarum flavis; posticis supra puncto medio fasciæque transversa, subtus totis flavis, fusco subtesselatis, margine interno fusco.—Expans. alar. unc. 1."

"Habit. in Himalaya." (*Kollar, l. c.*)

Var. **confucius**, Felder. "Alis supra saturate fuscis, anticarum vitta costali fasciæque exteriori subrefracta, posticis macula elongata cellulae fasciæque pone discum irregulari utrinque fulvis, subtus anticarum extimo posticarumque pagina omni pallide fulvis, his regione anali nigricante. ♂.

"Ning-po.—*P. angjali*, Linn. affinis, alæ posticæ vero apud angulum analem minus productæ. Magnitudo eadem." (*Fletcher, l. c.*)

Var. **flava**, Murray. (Plate XL, fig. 13, ♀.) "Alis supra brunneis flavo-notatis; subtus pallidioribus, posticis flavis, brunneo-maculatis. Antennis hamatis. Exp. alar., 1" 2"–1" 4".

"Hab. Japonia.

"Upperside. Fore wings dark brown: base dusted with yellow; costal, inner marginal and median yellow streaks from the base, the latter expanding into a rather large yellow spot at the end of cell, above which are two yellow dashes, bordering the first subcostal nervule. Beyond the middle is a conspicuous yellow band, divided into spots by the veins; the fourth and fifth are displaced, as in the allied species, and situated much nearer the hind margin. Hind wing dark brown: a yellow spot near base, and a smaller one above it, near the costa; a conspicuous yellow band beyond the middle, reaching from submedian to subcostal nervures. The small costal spot before-mentioned may be considered as an upward continuation of this band. The brown portions of both wings are more or less dusted with yellow. Fringe yellow, cut with fuscous, especially on fore wing.

" Underside. Fore wing paler than above: only the costal streak from base present, which reaches to the subcostal dashes corresponding to those existing on the upper surface; discoidal nervule bordered, often broadly, with ochreous, along the basal half of its course; apical portion of hind margin ochreous. Hind wing brown, thickly dusted with ochreous except at anal angle, where is a large brown patch, extending in a narrow streak to the base. Spots as above, but with an additional basal spot above the cell. The transverse band is bounded outwardly by a more or less distinct zigzag brown line.

" Allied to *P. angias*, L.

" This is the species referred to in my former paper as *P. dara* (?), Koll. Further investigation has convinced me that it is distinct; nor can I find it described by any other author. It seems to be a common species near Yokohama." (*Murray, l. c.*)

This species appears to be common throughout the region dealt with in the present work.

Confucius of Felder is identical with var. *flava*, and has nothing to do with *angias*. There are two forms in China which may possibly be seasonal; one of these is of the *confucius* = *flava* form (Plate XL. fig. 13, ♀), and the other is characterized by having more yellow on upper surface and the absence of greenish suffusion on under surface of secondaries (Plate XL. fig. 14, ♂).

According to Elves (Trans. Ent. Soc. Lond. 1888, p. 451) *P. dara* is common in Sikkim up to 5000 feet from April to December. He adds:—" After comparing a long series of this species, namely, twelve from the North-west Himalayas (*masa*, Moore); eight from Sikkim, one named *masa* by Moore; four from Khasias taken by myself, three from Japan, and three from China, I believe they are all the same species; and I see that in Moore's paper on Hocking's Kangra collection he has identified *masa* with *dara*."

Staudinger states that Dörries brought specimens from Amurland which do not differ from Japanese examples.

I have not seen the type of *Pamphila japonica*, Mabille*, but from the

* *Pamphila japonica*, Mabille, Ann. Soc. Ent. Belg. xxvii. p. lxxiii (1883).

" Præcedenti similis [*P. heterus*, Mab.]; sed magis nigor. Costa maculam flavam longiorem habet, et strigam similem in basi; vitta nigra vix tangit marginis teniam nigram et vitta flava a costa et apice continua est, ut in *P. sunia*, Feld. A quo recedit pagina inferiore posticarum alarum, quæ lutea est, cum margine abdominali luteo, vix ad angulum infusento.

" Cette espèce ressemble beaucoup au *P. sunias*, Feld., et au précédent [*P. heterus*]. La bande noire des ailes supérieures n'est pas bifurquée et ne touche pas la bordure au-dessous de l'apex. La côte a un trait jaune à la base et une tache très allongée. La bandelette fauve du disque est continue, elle commence à la côte, fait un coude et revient vers le bord interne. La bande jaune des ailes inférieures se rejoint au point jaune du bord antérieur, et le dessous des mêmes ailes est tout entier jaune; une série de points noirs indique la bande du dessus, reproduite un peu en clair. Les palpes sont d'un jaune soufre, avec le dernier article aciculaire, long et noirâtre. Japon." (*Mabille, l. c.*)

description I am disposed to consider that it is identical with the Japanese form of *P. dara*, i. e. *flava*, Murray, as that is the only species of *Padraona* met with in Japan.

Padraona gola. (Plate XI. fig. 12, ♂.)

Pamphila gola, Moore, Proc. Zool. Soc. Lond. 1877, p. 594, pl. lviii. fig. 9, ♂.

"*Male*. Upperside dark vinous brown; fore wing with an oblique discal irregular sinuous-bordered golden-yellow band, the band bent before the apex and indented at end of the cell; hind wing with a median discal golden-yellow band, and a few hairs of the same colour at the base; cilia edged with golden yellow. Front of head, palpi, and legs golden. Underside with the bands as above; costa and apex of fore wing and the hind wing suffused with yellow; both wings with a blackish streak at end of cell.

"Expanse 1 inch.

"S. Andamans." (Moore, l. c.)

I received one male example from Kiukiang, Central China, where it was captured in June. It is rather more fulvous on upper surface, but in all other respects it agrees with Sikkim specimens. The under surface of secondaries is rather darker than the type in Mr. Moore's collection.

Elwes says that he has a specimen from Buxa, Bhotan, which has been identified as *P. gola* by Mr. Moore. Wood-Mason and de Nicéville record thirty-seven specimens in both sexes taken in and around Silcuri, Cachar, captured between 25th May and 5th August.

Padraona virgata. (Plate XI. fig. 15, ♂.)

Pamphila virgata, Leech, Entomologist, xxiii. p. 47 (1890).

Male. Dark brown. Primaries have a fulvous streak from base parallel with costa to beyond the middle, this streak is broken up by the subcostal nervules into linear spots, its outer extremity curving downwards, and terminating directly over four fulvous spots placed in the median and submedian interspaces, there are two more or less confluent yellow dashes in the discoidal cell, and the base and inner margin are streaked with fulvous scales. Secondaries tinged with fulvous towards base, with some fulvous central dashes. Fringes yellow, chequered with dark brown. Under surface of primaries blackish, with centre spots as above, but the costal streak and discoidal spots are not so clearly defined, the apical half of outer margin is suffused with yellow, but the base is not sprinkled with yellow scales. Secondaries yellow, with some spots at the base, an indistinct central band, and two parallel transverse series of spots before the outer margin, black, more or less obscured with yellow; the abdominal fold is streaked with blackish.

Female. Similar in ground-colour to the male, but the yellow costal streak is ill defined, except above the one discoidal spot, the central spots are smaller, and all are pale in colour. Expanse 30-32 millim.

A fine series from Chang-yang and Ichang, Central China, taken in June and July. I have also received specimens from Moupin in Western China, and I took examples of each sex at Foochau in April 1886. Kricheldorf informs me that this insect is fond of settling in damp places on paths.

The type specimen is rather paler on the under surface than the example figured, which represents the usual form of the species.

Padraona maga. (Plate XL. fig. 18, ♂.)

Pamphila maga, Leech, Entomologist, xxiii. p. 48 (1890).

Male. Superficially resembles *P. virgata*, but the thorax is much stouter, and the primaries are without the yellow costal streak of that species, there are two yellow spots in discoidal cell, the lower of which is oblong and much the larger; beyond are six other yellow spots forming a transverse series, three of these are close together near the costa, one in each median interspace, and one near the submedian nervure. Secondaries have one spot in each median interspace. Under surface of primaries blackish; costa and upper portion of outer margin broadly suffused with yellow; the yellow spots of the upper surface are, with the exception of the sixth, reproduced, the second to fourth each followed by a black spot, and there is a submarginal series of indistinct black spots between apex and first median nervure; a projection from the yellow marginal border passes between the costal and central spots. Expanse 32 millim.

One male example taken at Ichang in June, and I captured two specimens of the same sex at Ningpo in April, 1886.

Padraona trimacula. (Plate XL. fig. 17, ♂.)

Taractroceera trimacula, Leech, Entomologist, xxiv., Suppl. p. 60 (1891).

Male. Fuliginous; the primaries with three large yellow spots, one in the cell and two beyond, and a short yellow dash along the subcostal nervure; the secondaries have a yellow central spot. Fringes of all the veins yellow, narrowly chequered with black at the ends of the veins. On the under surface the markings are much as above, but the streak on subcostal nervure extends from base to the upper yellow spot, and there is a yellow subapical dash; the secondaries are yellow, with a large black spot about middle of costa, and some blackish markings on the centre of the wing, and along the abdominal and outer margins. Expanse 30 millim.

One male specimen from Wa-ssu-kow captured in June.

This and the two previous species are only placed provisionally in *Padraona*. Probably it may be found necessary to erect one or more new genera for their reception.

Genus TELICOTA.

Astycus, Hübner, Catal. Frank. p. 185 (1825). Type, *augias*, Linn.

Telicota, Moore, Lep. Ceyl. vol. i. p. 169 (1881); Watson, Proc. Zool. Soc. Lond. 1893, p. 102. Type, *augias*, Linn.

"Antennæ: club stout, elongate, terminal crook short. Palpi: second joint laxly scaled, third joint suberect, bluntly conical. Fore wing: inner margin longer than outer margin; cell less than two thirds the length of costa; vein 5 close to bottom of cell. In the male; vein 3 is well before the end of cell, considerably nearer to vein 2 than to 4, and vein 2 is nearer to the end of the cell than to the base of the wing. In the female vein 3 is immediately before the end of the cell, and vein 2 is nearer to the base of the wing than to the end of the cell. Hind wing: vein 7 well before the end of cell, the upper margin of cell being bent downwards at its origin; discocellulars faint; vein 5 not traceable; veins 2, 3, and 4 all close together; vein 3 about twice as far from 2 as from 4. Hind tibiae with two pairs of spurs. Male with a linear discal stigma on the upperside of the fore wing, extending from the base of vein 4 to as far as the submedian, being twice interrupted at veins 2 and 3.

"Scott, in his 'Australian Lepidoptera,' has figured what he identifies as the two sexes of *phineus*, Cramer; the male figured is the female of *angiales*, and the female appears to be a bad figure of *Padraona prusias*, Felder. The true *phineus*, described from Surinam, is in the British Museum from Ecuador and Bolivia, and is the type of a distinct genus. Mr. Butler has also wrongly identified *phineus* and records it from Amboina.

"Hübner's name *Astycus* has not been adopted for this genus, as it has never been characterized, and was only published in a sale-list of Frank's collection; the twenty-two species enumerated under it belong to at least thirteen different genera.

"This genus ranges from India to Australia." (*Watson, l. c.*)

Telicota bambusæ.

Pamphila bambusæ, Moore, Proc. Zool. Soc. Lond. 1878, p. 691, pl. xiv. figs. 11 ♂, 12 ♀.

Telicota bambusæ, Distant, Rhop. Malay. p. 382, pl. xxxv. fig. 12 (1886).

"Allied to *P. augias*, Linn., from typical Java specimens of which it differs in its somewhat broader and less pointed wings. Markings above similar, but more defined, the borders of the wings blacker, the basal yellow streak on the hind wing confined to a terminal spot at the end of the cell, and the abdominal border black. On the underside the markings are also more clearly defined and the interspaces blacker.

"Expansion, ♂ 1 $\frac{3}{4}$, ♀ 1 $\frac{1}{2}$ inch.

"Larva feeds on the bamboo." (*Atkinson, MS. note.*)" (*Moore, l. c.*)

I have only received two specimens of this species from China. They

were both taken at Chang-yang in June, and agree very well with Sikkim examples.

De Nicéville (Journ. Asiat. Soc. Beng. liv. p. 53, lv. p. 384) records it as common in all seasons in the neighbourhood of Calcutta and plentiful in Cachar. Elwes (Trans. Ent. Soc. Lond. 1888, p. 450) states that in Sikkim it occurs at elevations up to 5000 feet from April to December, but is not common.

I met with an allied species, *T. augias*, Linnaeus, at Foochau in April; but, so far as I know, it has not been taken within the region here dealt with.

Genus AUGIADES.

Augiades, Hübner, Verz. p. 112 (1816); Watson, Proc. Zool. Soc. Lond. 1893, p. 103.
Type, *sylvanus*, Esper.

“Antennæ: club robust, elongate, terminal crook short. Palpi: second joint laxly scaled, third joint short, obtusely conical. Fore wing: inner margin slightly longer than outer margin: cell less than two thirds the length of costa; vein 5 from close to bottom of cell; vein 3 immediately before the end of cell; vein 2, in male considerably, in female slightly nearer to base of wing than to end of cell. Hind wing: vein 7 well before the end of cell; discocellulars faint; vein 5 not traceable; vein 3 immediately before the end of cell, many times farther from 2 than from 4; vein 2 considerably nearer to end of cell than to base of wing. Hind tibiae with a long fringe and with two pairs of spurs. Male with a linear discal stigma on fore wing extending from origin of vein 3 to as far as vein 1.” (*Watson, l. c.*)

Augiades sylvanus.

Papilio sylvanus, Esper, Schmelt. i. 1, pl. xxxvi. fig. 1 (1778?).

Hesperia sylvanus, Latreille, Enc. Méth. ix. p. 770 (1823); Lang, Butt. Eur. p. 352, pl. lxxxii. fig. 1 (1881); Pryer, Rhop. Nihon. p. 31, pl. x. figs. 13 *a*, 13 *b* (1889).

Hesperia venata, Bremer & Grey, Schmelt. N. China's, p. 11, pl. iii. fig. 5 (1853); Ménétrics, Cat. Mus. Petr. Lep. i. pl. v. fig. 8 (1855).

Pamphila herculea, Butler, Ann. & Mag. Nat. Hist. (5) vii. p. 140 (1881).

Pamphila selas, Mabille, Pct. Nouv. ii. p. 233 (1878).

“Expands from 1.20 to 1.40 in. The male is fulvous; the hind margins of the fore wings and all the marginal portions of the hind wings brownish fuscous. The fore wings have the discal black line very distinct. Underside: hind wings yellowish, with some very indistinct central markings; the inner margin tinged with fulvous. The female is somewhat larger than the male; the wings are brownish. Fore wings without the sub-discoidal black streak, with a submarginal row of large fulvous spots; the basal portion is fulvous towards the costa. Hind wings with a row of fulvous spots forming a band. The antennæ have clubs hooked at the extremities.

“*Larva*. Dull green, dorsal stripe darker, dotted with black. Head large and brown. Feeds in April on *Triticum repens*, *Holcus lanatus*, and other grasses.” (*Long, l. c.*)

Var. **venata**, Bremer & Grey.—“ Alis supra: fulvo-ochraceis, nigro-marginatis et venatis, apice non nihil obscuriori, linea discoidali nigra; subtus: omnibus fulvo-ochraceis, anticis basi nigra.

“ Expans. alar. antic. unc. $1\frac{1}{2}$.” (*Bremer & Grey, l. c.*)

This is simply an occasional aberration of *sylvanus*, and gradations between it and the next form, var. *herculea*, occur.

Var. **herculea**, Butler. “ Allied to *P. sylvanus*, considerably larger; the male of a clearer, more ochraceous colour above, and on the under surface of a more uniformly tawny colour; the secondaries not yellowish, as in *P. sylvanus*; pattern similar. Expanse of wings 1 inch 7 lines.

“ *Female*. Above bronzy brown or chocolate-brown, with cupreous reflections: primaries with a yellow dot just above the basal third of submedian vein; a cuneiform spot filling the base of the first median interspace; a bifid spot at the end of the cell; a series of five quadrate spots, excised in front, crossing the disc obliquely from submedian to upper radial vein, and a trifid spot across the subcostal branches, halfway between the cell and the apex; secondaries with an angular discal series of five ochreous spots. Wings below with the markings paler than above, the spots creamy whitish or pale bone-yellow; disc of primaries round the borders of the oblique series of spots olive-brown; external angle and outer border white brown; secondaries bronzy olive-brown, the discal series consisting of six spots; anal angle broadly ochreous; outer border tinted with ochraceous; palpi white; body below bluish grey. Expanse of wings 1 inch $7\frac{1}{2}$ lines.

“ One pair only was obtained. Nikko.” (*Butler, l. c.*)

A. sylvanus appears to be a common insect in Japan, Corea, North and Central China, and also in Amurland. It exhibits considerable variation, and the specimens are nearly always larger than those from Europe.

Selas, Mabille, from Thibet, is a form of *A. sylvanus* with the upper surface of the fore wings unicolorous, as in var. *venata*, Bremer; the under surface is also almost destitute of markings. The same form occurs as an aberration in China and Corea.

Amurensis, Mabille, is a very worn example of *A. sylvanus*, and when fresh probably represented the form described by Butler as *herculea*.

Distribution. Europe, Northern and Western Asia, the Altai, Amurland, Japan, Corea, North and Central China.

Angiades subhyalina. (Plate XLI. fig. 8, ♂.)

Hesperia subhyalina, Bremer & Grey, Schmelt. N. China's, p. 10, pl. iii. fig. 4 (1853).

Pamphila subhyalina, Ménétrics, Cat. Mus. Petr. Lep. i. pl. v. fig. 7 (1855).

Pamphila subhyalina, var. *thibetana*, Oberthür, Etud. d'Entom. xi. p. 28, pl. vi. fig. 45 (1886).

"Alis supra: fulvis, venis marginibusque fuscis, punctis maculisque flavis, iisque in ala antica pæne hyalinis, linea discoidali crassa nigra: subtus: fulvis, maculis flavis, fasciatis, margine interno nigro: posticis fulvis, flavo-maculatis.

"Expans. alar. antic. unc. 1½." (*Bremer & Grey, l. c.*)

Female. The spots are more transparent, and the primaries rather rounder on outer margin.

Var. **thibetana**, Oberthür. "Cette variété constante est plus petite, le dessous des ailes inférieures est plus obscur et le nombre des taches plus claires y est réduit." (*Oberthür, l. c.*)

This form is chiefly distinguished from typical *subhyalina* by its smaller size and the darker coloration of both surfaces. It is common in Western and Central China, whence I have also received specimens which are intermediate between *thibetana* and *subhyalina*.

I met with *A. subhyalina* commonly in June at Gensan and Fusan in the Corea. Herz also took it in Corea and in the neighbourhood of Peking. It is found in Amurland, in Yesso, and probably in the mountainous parts of Central Japan.

The subhyaline spots of primaries and more prominent white spots on under surface of secondaries will at once separate this species from *sylvanus*.

Distribution. Northern, Western, and Central China, Japan, Corea, Amurland.

Augiades crataëis, sp. nov. (Plate XLI. figs. 9 ♀, 11 ♂.)

Male. Very similar to the same sex of *A. subhyalina*, but larger. The spots on primaries are more transparent, and the sexual mark is traversed by a whitish line interrupted by the first median nervule. The fourth and fifth spots on secondaries are bolder, and the second and third are either faint or entirely absent.

Female. Darker than the male; all the spots on primaries are larger and whiter; those on secondaries are paler.

Under surface in both sexes browner than in either *A. subhyalina* or var. *thibetana*.

Expanse, ♂ 43-45 millim., ♀ 44-47 millim.

Occurs commonly at Omei-shan in July and August; I have also received it from Chia-kou-ho.

Augiades bouddha. (Plate XLI. figs. 7 ♀, 14 ♂, 10 ♀ var.)

Pamphila bouddha, Mabille, Ann. Soc. Ent. France, 1876, p. lvi.

"Alis nigro-fuscis, basi et costa fulvescentibus, fimbria fulva. Anticis octo puncta ferentibus, tria ad apicem coadunata, duo in cellula in unum confusa, et tria obliqua posita, unum versus marginem medioerem, secundum triangulare, magnum, tertium elongatum, omnia hyalino-fulva, et strigam, sexus indicem, spissam nigram a puncto geminato cellule obliquam usque ad

punctum elongatum. Alis posticis disco obscure fulvescente, cum tribus punctis rotundatis, pallide fulvis, uno ad angulum apicalem et duobus approximatis in disco. Subtus alis anticis griseo-fulvescentibus, nisi ad marginem internum, ubi in spatio nigrescenti maculæ albescunt; posticis rufo-virentibus, cum punctis albidis.

"Femina a mare differt, striga antiearum nulla punctis minoribus in cellula separatis, albescentibus, puncto marginis interni parvo, triangulari, solo lutescenti. Alis posticis disco fulvescente cum puncto baseos fulvo, et serie incurva 4 punctorum fulvorum in disco, alis posticis subtus magis virentibus. Antennæ apice nigra, basi fulva.

"Revolet *P. subhyalina* Brem. Amurensis." (*Mabille, l. c.*)

This species is closely allied to *A. subhyalina*, var. *thibetana*, but is readily separated therefrom by the discal spots on secondaries. The male type here figured (Plate XLI. fig. 14), kindly lent to me by M. Mabille, was taken by l'Abbé David in Moupin. My collectors failed to meet with this sex, but I received a female example from Omei-shan (Plate XLI. fig. 7), which seems to agree very well with the description of that sex, and another female from Moupin (Plate XLI. fig. 10) which agrees better with the male in the colour of the spots on secondaries, as these are white instead of yellow. I propose that this form be known as var. *consors*.

Augiades sylvanoides, sp. nov. (Plate XLI. fig. 4, ♂.)

In general characters this species resembles *A. subhyalina*, but it is smaller and has no semi-transparent spots, in which respect it agrees with *A. sylvanus*.

Male. Fuliginous brown. Primaries are ornamented with fulvous as follows:—a streak along the costa extending from base of the wing to the first of three subapical elongate spots; a streak in discoidal cell along median nervure surmounted by a linear spot at end of cell; below the subapical spots are two round ones, and placed obliquely under these are three other spots, the first triangular, the second quadrate, the third oblong and only separated from a basal euneiform dash by the lower portion of the black sexual band, which is similar in shape to that of male *A. subhyalina*. Secondaries fuliginous, slightly suffused with fulvous on the basal area; five fulvous spots, arranged as in *A. subhyalina*, but more clearly defined; central spot fulvous, not always distinct. Fringes fulvous grey, those of primaries tinged with dusky. Under surface similar to that of *A. subhyalina*, but the secondaries have a slight greenish tinge, and, as on upper surface, there are no semitransparent spots on primaries.

Female. Almost black; bases of all the wings, especially of the secondaries, dusted with fulvous; primaries have a double fulvous spot at end of discoidal cell and a punctiform spot in the first median fork; beyond there is a series of fulvous spots as in the male; the markings on secondaries are similar to those of *A. subhyalina*, var. *thibetana*, on the upper surface, but are identical with the male on under surface.

Expanse 33-35 millim.

Not uncommon at Ta-chien-lu and Wa-sssu-kow in June and July.

Augiades similis, sp. nov. (Plate XII. fig. 6, ♂.)

Male. Blackish, suffused with fulvous on the basal area of all the wings, but especially on primaries; sexual brand similar to that of *A. sylvanoides*. Primaries have the following fulvous markings:—a streak in the discoidal cell, uniting at its outer extremity with an oblong spot; beyond the cell there is a series of eight spots, the fourth and fifth small and round, forming a colon-like mark between three elongate subapical spots, and three quadrate ones forming an inwardly oblique series to inner margin; the last of these eight spots is sometimes divided. Secondaries have a central band of five fulvous spots, the second and third hardly separate. Fringes fuscous grey, paler towards anal angle.

Female. Similar to the male, but the streak in discoidal cell is linear, sometimes interrupted, and there are sometimes two extra spots, a triangular one in the first median fork and a round one below it on submedian nervure.

Under surface in both sexes as in *A. sylvanoides*, but generally darker, and the spots on secondaries are more distinct.

Expanse 34 millim.

Occurs in Western China at Ta-chien-lu, Moupin, and Wa-shan in June and July.

Apart from the different markings this species may be distinguished from *A. sylvanoides* by the more acute apex of primaries and distinctly produced anal angle of secondaries.

Augiades ochracea.

Pamphila ochracea, Bremer, Bull. Acad. Pet. iii. p. 473 (1861); Lep. Ost-Sib. p. 33, pl. i. fig. 11 (1864).

Pamphila rikuchina, Butler, Cist. Entom. ii. p. 285 (1878).

Hesperia rikuchina, Pryer, Rhop. Nilou. p. 34, pl. x. figs. 16 a ♀, 16 b ♂ (1889).

"Alae supra ochraceae, nervis nigris.

"Alae anticae margine posteriore late fusco vittaque transversa fusca a margine anteriore ad marginem interiorem dueta; alae posticae late fusco-marginatae.

"Alae subtus sicut supra, sed dilutiores. 25 m." (*Bremer, l. c.*)

Var. **rikuchina**, Butler. "Deep purplish brown, the basal area of the wings clothed with tawny scales; fringes ochreous, especially at the anal angle; primaries with two ochreous spots at the end of the cell (the upper one punctiform); a rather broad irregular angulated discal ochreous belt, not reaching the inner margin, and divided into nine spots by the veins, which are black; secondaries with an arched series of five ochreous spots on the disc; body olivaceous, abdomen clothed with ochraceous hair-scales; palpi pale greenish yellow; wings below paler than above, more broadly and densely sprinkled with ochraceous scales; the secondaries with the abdominal area, particularly at anal angle, broadly ochraceous; body below greenish grey.

"Expanse of wings 1 inch 4 lines. Occurs at Rikuchin." (*Butler, l. c.*)

The above description by Butler refers to the Japanese representative

of *ochracea*, but although larger this does not differ in any important character from the Amurland type. The under surface of secondaries is liable to vary in the male; sometimes this is of an almost uniform yellow, and sometimes it is strongly tinged with green, and the pale spots are well developed.

I met with this species in the Corea in June and in Central Japan in July. Oberthür records it from the Isle of Askold.

Distribution. Amurland, Askold, Corea, and Japan.

Genus PARNARA.

Parnara, Moore, Lep. Ceyl. i. p. 166 (1881); Watson, Proc. Zool. Soc. Lond. 1893. p. 105. Type, *guttata*, Brem.

Chapra, Moore, Lep. Ceyl. i. p. 169 (1881). Type, *mathias*, Fabr.

“Antenna: club short and stout, terminal crook very short, tip acuminate. Palpi as in *Baoris*. Fore wing: inner margin longer than outer margin; cell less than two thirds the length of costa; vein 12 reaching costa well before end of cell; upper discocellular minute, middle very long, lower very short; vein 5 from close to bottom of cell; venation entirely as in *Baoris*. Hind tibiae with two pairs of spurs. Male in some species with a linear discal streak on the fore wing, situated obliquely between veins 2 and 1.

“The sole difference between the two genera *Chapra* and *Parnara* is the presence or absence of the sexual streak of the fore wing, a character which is certainly of no value in this genus, as it would assign two such closely allied species as *borbonica* and *mathias* to two separate genera.

“This genus is closely allied to *Baoris*, from which it may be separated by the shape of the antennal club.

“African and Asiatic.” (*Watson, l. c.*)

Parnara mathias.

Hesperia mathias, Fabricius, Ent. Syst. Suppl. p. 433 (1798).

Epargyreus mathias, Butl. Cat. Fabr. Lep. p. 275, pl. iii. fig. 6 (1870).

Pamphila mathias, Butler, Proc. Zool. Soc. Lond. 1870, p. 728; Pryer, Rhop. Nihon. p. 33, pl. x. fig. 7, ♀ (1889).

Chapra mathias, Moore, Lep. Ceyl. i. p. 169, pl. lxx. figs. 1, 1a (1881).

Parnara mathias, Butler, Proc. Zool. Soc. Lond. 1884, p. 493.

Baoris mathias, Distant, Rhop. Malay. p. 380, pl. xxxv. fig. 10 (1886).

“Alis eandatis, fuscis; anticis utrinque hyalino maculatis; posticis subtus punctis albis.” (*Fabricius, l. c.*)

“Wings above vinous brown, the fringe greyish; anterior wings with eight small greyish spots,

situate two in cell, three in suberect and subapical series beyond cell, and three in oblique series, of which the uppermost is smallest, divided by the first and second median nervules; between the lowermost spot and the submedian nervure is a narrow, transverse, linear, greyish impression. Wings beneath paler than above; anterior wings spotted as above, but the spots a little darker in hue; posterior wings with a small pale spot in cell, and a curved discal series of small pale spots situate between the costal nervure and the lower median nervule. Body above more or less concolorous with wings; palpi and abdomen beneath greyish.

“Expanse 31–33 millim.” (*Distant, l. c.*)

This species is common in Central and Southern Japan. It is also recorded from Ningpo, and I have received it from Chia-ting-fu, Western China.

According to Elwes (*Trans. Ent. Soc. Lond.* 1888, p. 444) it is frequent in Sikkim from April to December up to 7000 or 8000 feet. The same writer also states that it is common in most parts of India, and adds that *P. (H.) agna*, Moore (*Proc. Zool. Soc. Lond.* 1865, p. 791), is probably a synonym.

In the National Collection at South Kensington specimens from China and Japan, identical with my examples from those countries, are placed with Indian specimens under *P. agna*.

Mr. Forsyth (*Trans. Ent. Soc. Lond.* 1884, p. 387) states that two larvæ found on August 27th became pupæ on September 3rd, and the perfect insects emerged on September 13th. He describes the larva and pupa as follows:—

Larva. “Head triangular, on a neck; a brown line along the margin of head. Body grass-green, with light yellow bars across back. A whitish line along either side above the origin of legs. Legs 6, 8, 2. Found on long, coarse, green meadow-grass in August.”

Pupa. “Along a blade of grass, attached by a band across thorax and also at tail. Head generally points upwards. Body of a translucent green colour, quite naked, and unenclosed in a covering of any description.”

Distribution. Aden; Continental India; Ceylon; Nicobar Islands; Burma; Tenasserim; Malay Peninsula; Siam; Nias Island; Java; Formosa; Chin-Lushai; China; Japan.

Parnara mencia. (Plate XLII. fig. 14, ♂.)

Pamphila mencia, Moore, *Ann. & Mag. Nat. Hist.* (4) xx. p. 52 (1877).

“*Male and female.* Upperside dark glossy olive-brown: fore wing of male with a curved discal series of five small yellowish spots, and with a contiguous oblique prominent narrow streak; two small spots also at end of the cell: hind wing with a discal series of three indistinct spots. Female differs in the absence of the oblique narrow discal streak on fore wing, and

the spots on the hind wing. Underside paler, longitudinally streaked with grey: spots the same; sexual streak on male not visible. Exp. $1\frac{6}{10}$ inch.

"Shanghai.

"Wings much broader than in *P. sinensis*, Mabille, and the hind wing is not lobed as in that species." (Moore, l. c.)

I have received this species from Kiukiang, and also from Ningpo, occurring in April in the latter place. There are specimens from Shanghai and Nankow in the National Collection.

Parnara sinensis. (Plate XLII. fig. 11, ♂.)

Gegeus sinensis, Mabille, Bull. Soc. Zool. Fr. 1877, p. 232

Chapra prominens, Moore, Proc. Zool. Soc. Lond. 1882, p. 261.

Pamphila similis, Lecch, Entomologist, xxiii, p. 48 (1890).

Gegeus sinensis, Mabille.—"Mâle très-grand (44 mill. Femelle 46-48 mill.), d'un brun obscur, avec la disque lavé de roux; sur les premières ailes, deux taches oblongues dans la cellule, trois petites et carrées devant l'apex, et trois autres plus grosses en avant de la cellule, faisant suite aux trois précédentes et formant avec elles une ligne courbe, puis oblique. Un fort trait gris jaunâtre ombré de noir en dessus part de la dernière des taches et va s'arrêter sur la simple inférieure. Au lieu de ce trait, la femelle a une tache de plus jaunâtre; toutes les autres sont blanchâtres et semi-transparentes. Inférieures ayant une ligne de quatre points semblables, très petits en face de la cellule et près du bord externe. Le dessous des supérieures a le même dessin, mais il est semé d'écaillés jaunâtres. Celui des inférieures est d'un brun verdâtre avec les quatre points du dessus et un de plus au milieu de la cellule; la tête et la poitrine sont jaunâtre clair; les palpes sont jaunes en dessous.

"De la Chine septentrionale." (Mabille, l. c.)

"Male and female. Upperside dark olive-brown, basal area brighter olive. Male—fore wing with eight rather large quadrate yellowish semi-luaphanous spots, three being disposed before the apex, three discal, and two very obliquely at end of the cell; a prominent narrow oblique yellow band or streak below the cell, which in the female is replaced by two spots, the upper one of which is very small; hind wing with four yellow semi-luaphanous contiguous spots. Underside paler; spots on fore wing as above, the band showing as a diffused yellow patch from its outer edge; the series of spots on hind wing more prominently white, with a fifth spot at the upper end, and one also at the upper end of the cell.

"Expanse $\frac{6}{10}$ inch.

"Hab. N.W. Himalaya; Tonse valley, 6000 feet; Gurwhal (Lang), Kussowlee; Kangra. In coll. F. Moore, Major Lang, and British Museum." (Moore, l. c.)

I have now a fine series of the species which I described as "*Pamphila similis*," and find that the example from Chang-yang, which I erroneously considered to be a female, is really a male. I also find that the specimens are referable to *sinensis*, Mabille, of which *prominens*, Moore, is also a synonym.

Sikkim specimens agree with those from China: in the latter the spots on

secondaries vary in number from three to five, and they may be either white on the under surface or subhyaline; in the example figured (Plate XLII. fig. 11) they are white, and the second and third spots are confluent.

Elwes states that it is common in Sikkim up to an elevation of 5000 feet from April to October.

Occurs in Western China at Chia-ting-fu, Wa-ssu-kow, Moupin, Pu-tsu-fong, Chia-kou-ho, and Omei-shan; and at Kiukiang, Ichang, and Changyang in Central China.

Parnara guttata.

Eudamus guttatus, Bremer & Grey, Schmett. N. China's, p. 10, pl. iii. fig. 2 (1853).

Goniloba guttatus, Ménétrics, Cat. Mus. Petr. Lep. i. pl. v. fig. 4 (1855).

Pamphila guttata, Pryer, Rhop. Nihon. p. 34, pl. x. fig. 10 (1889).

Parnara guttatus, Elwes, Proc. Zool. Soc. Lond. 1888, p. 445.

Hesperia fortunei, Felder, Verh. zool.-bot. Ges. Wien, xii. p. 489 (1862); Reis. Nov. Lep. pl. lxxii. fig. 11 (1866).

"Alis supra: fuscis; corpore et basi alarum fusco-viridibus; anticis media guttis duabus hyalinis et fascia apicali guttis hyalinis sex composita; posticis medio guttis hyalinis quatuor in seriem dispositis;—subtus iisdem ut supra.

"Expans. alar. antic. unc. 1½." (*Bremer & Grey, l. c.*)

Fortunei, Felder.—"Alis supra brunneis, basin versus olivascenti pilosis, ciliis albidis, anticarum punctis duobus cellularibus maculisque sex pone ea, in fasciam ordinatis; posticarum fasciola disci maculari perobliqua, subhyalina, his subtus dilute ocreaceis, fasciola paginae superioris, sed argentea ♂." (*Felder, l. c.*)

Common all over Japan and Corea; it can be easily distinguished from *P. pellucida* by its longer, narrower wings, and by the spots of the hind wing, which are almost in a straight line, while in *P. pellucida* the arrangement is alternate.

Elwes (Proc. Zool. Soc. Lond. 1888, p. 445) records it from Kashmir (= *mangala*, Moore), Mandi, and Sikkim. All the Indian specimens that I have seen agree with those from Japan and China. Staudinger (Rom. sur Lép. vi.) says that the species occurs in Amurland.

Parnara colaca. (Plate XLII. fig. 5, ♂.)

Parnara colaca, Moore, Proc. Zool. Soc. Lond. 1877, p. 594, pl. lviii. fig. 7; Elwes, Trans. Ent. Soc. Lond. 1888, p. 446, fig. 1; Wood-Mason & de Nicéville, Journ. Asiat. Soc. Beng. lv. p. 383 (1886).

"Male and female. Dark olive-brown; cilia cinereous; fore wing with a recurved discal series of

seven small yellow spots, the second from the hind margin being the largest; a small spot also at end of the cell. Underside brown, apex and hind wing speckled with olive-green scales; a median discal series of small spots on hind wing.

“Near to *H. cinerata*.

“Expansion, ♂ $1\frac{2}{10}$, ♀ $1\frac{3}{10}$ inch.

“S. Andamans.” (*Moore, l. c.*)

I have specimens from Chia-ting-fu, Western China, which agree exactly with some of the examples contained in a series in Möller's collection which have been identified as *P. colaca* by Mr. de Nicéville. My Chinese examples all agree in the absence of the discal and inner marginal spots on primaries, and in the presence of the central series of spots on the secondaries. *P. colaca* as figured by Elwes is very different to the type of the species as figured by Moore.

Elwes states that it is found at low elevations in Sikkim, but is not common. Wood-Mason and de Nicéville remark:—“Many examples of both sexes in and around Silcui, Cachar, from 30th of May to 13th June, which agree with specimens from the Andamans of this somewhat variable species.”

Parnara thyone, sp. nov. (Plate XLII. fig. 4, ♂.)

Dark brown, with an olivaceous tinge towards base of all the wings. Primaries with a white spot at outer extremity of cell, three subapical spots forming an oblique series and two central spots; in some specimens there is an additional minute white dot, sometimes there are two, above the central spots, and in other examples there is an indistinct white spot above the centre of the inner margin. Secondaries without markings. Under surface olivaceous: primaries have the inner marginal and anal areas fuliginous, and the spots of upper surface indistinctly reproduced: secondaries have a curved series of four small pale spots, but the number of these spots is variable, and in some specimens they are entirely absent.

The sexes do not differ in colour or marking.

Expansion 30–40 millim.

Allied to *P. colaca*, Moore, and *P. beavani*, Moore.

Occurs at Kiukiang and Ichang, Central China, and at Ta-chien-lu and Moupin, Western China.

I was formerly disposed to consider this species identical with *Gegenes hainanus*, Moore (Proc. Zool. Soc. 1878, p. 703), but on examining the type, which is in the collection of Messrs. Godman and Salvin, I find that the specimen is so worn and faded as to be useless for purposes of comparison; I could detect no pale spots on upper surface, but there were faint traces of central spots on under surface of primaries.

Parnara pellucida.

Pamphila pellucida, Murray, Ent. Mo. Mag. xi. p. 172 (1875); Pryer, Rhop. Nihon. p. 34, pl. x. fig. 11 (1889).

Pamphila pellucida, var. *quinquepuncta*, Mabille, Ann. Soc. Ent. Belg. xxvii. p. lxiv (1883).

Thymelicus pellucida, Staudinger, Rom. sur Lép. iii. p. 152, pl. viii. fig. 3 (1887).

Hesperia toona, Moore, Proc. Zool. Soc. Lond. 1878, p. 689; Wood-Mason & de Nicéville, Journ. Asiat. Soc. Beng. lv. p. 383 (1886).

"Alis supra brunneis, albo-maculatis: anticis maculis duabus disco-cellularibus super alteram anteriorem magnam quadratam, macula subapicali tripartita, alteris duabus inter maculas subapicalem et quadratam, strigaeque parva in vena submediana (maculis omnibus pellucidis). Posticis maculis quatuor pellucidis, fasciam brevem formantibus.

"Subtus, alis ochraceo-brunneis, anticis ad marginem interiorem nigro-fuscis, maculis ut in pagina superiore. Ciliis albis.

"Alar. exp. 1" 9".

"Hab. Japoniam.

"Allied to *P. gottata*, Brem., Grey, but sufficiently distinct. The spots on the hind wing are arranged in a curious alternate manner, the first and third being nearer the hind margin than the second and fourth." (*Murray, l. c.*)

"Allied to *H. ctota*, Hewitson.

"Male. Differs in the fore wings being slightly more elongate, the hind wing more convex exteriorly, and the anal angle less lobed; markings above similar, those on fore wing narrower, the spot between the median branches elongated and extending to their basal angle; those on the hind wing very small, the outer spot crossed by a vein. Underside brownish ochreous; base of fore wing slightly dusky ochreous; markings as above.

"Expanse $1\frac{1}{2}$ inch.

"Habitat. N.E. Bengal." (*Moore, l. c.*)

"Female. Rather larger and less richly coloured than the male, with the large discal semitransparent lustrous spot in the first median interspace of the fore wing shorter, emarginate, and not extending to the base of the interspace.

"One example has only the three posterior of the spots of the underside of the hind wing—and those much reduced in size—instead of five, but four are visible on the upperside." (*Wood-Mason & de Nicéville, l. c.*)

Var. **quinquepuncta**, Mabille. "Nous rapportons à cette espèce une forme qui, tout d'abord, paraît très différente. Elle est plus grande (40 millimètres). Les ailes supérieures ont les points un peu plus gros et il y en a un de plus assez souvent dans la ligne oblique, placé au-dessous des points apicaux, qui sont tous bien marqués et égaux. Les ailes inférieures offrent les quatre points allongés inégaux et inégalement placés et un cinquième près du bord antérieur, dont les mâles semblent dépourvus.

"Japon, montagnes de l'intérieur." (*Mabille, l. c.*)

This species varies considerably in size. I met with it commonly all over Japan, and also at Gusan in the Corea, and in the Kurile Islands. Several

of the specimens from Japan agree well with Mabille's description of var. *quinquepuncta*.

The only Chinese examples that I have received are from Omei-shan and Ichang; these are slightly darker than either Japanese or Indian specimens and the spots are somewhat larger.

Toona, Moore, occurs in Sikkim up to 7000 feet from April to November. It is also found in the Khasia Hills and Cachar. I am quite unable to separate Japanese or Chinese *pellucida* from Sikkim *toona*, and believe the former to be specifically identical with the latter.

Dörries and Graeser met with *P. pellucida* in various places in Amurland.

Distribution. Western and Central China, Japan, Corea, Amurland, and the Himalayas.

Parnara jansonis. (Plate XLII. fig. 12, ♂.)

Panaphila jansonis, Butler, Cist. Entom. ii. p. 284 (1878); Pryer, Rhop. Nihon. p. 34, pl. x fig. 12 (1889).

“♂. Bronzy olive-brown, with sordid white fringes to the wings; primaries with two small spots placed obliquely towards the end of the cell; five dots between the subcostal branches (the first two very small and wide apart) and an oblique series of five discal spots (the upper four in a decreasing series, pointing towards the apex, the first small and linear, just above the middle of the submedian vein), hyaline white; a slender oblique band connecting the first and second spots; secondaries with four small spots, the first and last punctiform, in a zigzag series not far from the apex; body normal, palpi sordid white; primaries below with the costal third, excepting at apex, densely covered with sordid ochraceous scales; hyaline spots as above, an additional white spot between the first and second of the oblique discal series; secondaries sordid ochraceous, with a broad greyish-brown pyramidal area on the internommedian interspace; a silvery-white spot in the cell, and four towards apex, the second of which is reniform; body below sordid greyish.

“Expanse of wings 1 inch 8 lines.” (*Butler, l. c.*)

This species is very closely allied to *P. pellucida*, but it differs on the upper surface in having only two longitudinal spots on the secondaries; it has a conspicuous white spot towards base of secondaries on under surface, as in *Parnara sinensis*, and all the spots on the under surface of these wings are white and not subhyaline as in *P. pellucida*.

Appears to be an exceedingly rare insect. The type was taken “on the Koshiunkaido in Shimodzuke.” The only other specimens that I have any knowledge of are two in the late Henry Pryer's collection from Ikao, Central Japan, and one male taken by myself at Gensan, Corea, in June.

Parnara eltola.

Hesperia eltola, Hewitson, Exot. Butt. iv. (*Hesperia*) pl. iv. fig. 40 (1869).

Parnara eltola, Wood-Mason & de Nicéville, Journ. Asiat. Soc. Beng. 1886, p. 384, pl. xviii. figs. 6, 6 a, ♂.

“Upperside dark brown. Anterior wing with eight transparent white spots, and a spot of yellow near the inner margin: the three largest spots across the middle, two outside of these, and three near the apex. Posterior wings with three transparent spots.

“Underside as above, except that it is rufous-brown.

“Expanse $1\frac{2}{3}$ inch. *Hab.* Darjeeling.” (*Hewitson, l. c.*)

Chinese specimens are larger and darker, as a rule, than those from Sikkim.

Occurs in Western China at Moupin, Wa-shan, Chia-ting-fu, Omei-shan, Wa-ssu-kow, in June and July, up to an elevation of about 5000 feet.

Elwes (Trans. Ent. Soc. Lond. 1888, p. 449) says:—“Common about gardens at 5000 feet in Sikkim, and also in the low valleys, and up to 7000 feet during the whole season.” Wood-Mason and de Nicéville record it from Cachar.

Parnara austeni. (Plate XLII. fig. 7, ♂.)

Baoris austeni, Moore, Proc. Zool. Soc. Lond. 1883, p. 533.

“*Male and female.* Upperside dark brown. *Male:* fore wing with two small semihyaline white spots at end of the cell, two before the apex, and three obliquely on the disc, the two upper of which are small. *Female* with markings the same, but slightly larger; also with a small yellow spot above the hind margin: cilia cinereous white. Underside as above: both sexes having also a slight yellowish patch above the hind margin.

“Expanse, ♂ $1\frac{3}{8}$, ♀ $1\frac{1}{8}$ inch.

“This species is allied to *H. cabira*, from the Andamans, and to *H. mooleta*, from Tenasserim.” (*Moore, l. c.*)

Not uncommon in Western China at Omei-shan, Moupin, Chia-kou-ho, Chia-ting-fu, and Kwei-chow in July. I also took it at Foochau in April.

This species exhibits considerable variation in the number of spots on primaries. Typical examples have two discoidal spots and a central series of five or sometimes six spots. In some examples from Omei-shan and Foochau the upper discoidal spot is absent, as also is the third spot from costa; these specimens are also paler in ground-colour than typical examples and are more suffused with yellowish. Similar variation is noticed in Möller's Sikkim series. In two female specimens from Omei-shan there is an indistinct whitish spot in the centre of under surface of secondaries, and in

another example of the same sex there is a pale spot towards costa on under surface of these wings.

Elwes, in his Catalogue of the Lepidoptera of Sikkim*, seems inclined to suppose that *P. cahira*, Moore, and *P. moolata*, Moore, may prove to be specifically identical with *P. austeni*. There are specimens in the National Collection from Rangoon, Burmah, and Upper Tenasserim, and Elwes gives Cachar and the Khasias as localities.

***Parnara nascens*, sp. nov.** (Plate XLII. fig. 8, ♂.)

Male. Fuliginous brown. Primaries have nine small subhyaline spots placed as follows:—one in discoidal cell, three towards apex, and five below these forming an inwardly oblique series, the third quadrate, and the fourth and fifth linear, indicating a sexual mark. Secondaries have four minute subhyaline central spots, but the second and fourth are often absent. Under surface dark greyish brown, the costal half of primaries and the whole of secondaries thickly powdered with ochreous scales; subhyaline spots as above, except that the last two of oblique series on primaries are absent.

Female. Similar to the male, but the subhyaline spots on all the wings are larger, the fifth of oblique series on primaries is round, and the fourth very minute or entirely absent.

Expanse, ♂ 44–46 millim., ♀ 46–47 millim.

Occurs in Western China, at Chia-kou-ho and Omei-shan, in June and July.

***Parnara bromus*, sp. nov.** (Plate XLII. fig. 10, ♂.)

Fuliginous brown. Primaries have ten subhyaline spots placed as follows:—two colon-like in the discoidal cell; three subapical, and below these an inwardly oblique series of five, of which the third is the largest and triangulate and the fourth is punctiform. Secondaries immaculate. Fringes pale grey-brown. Under surface paler than above; spots on primaries as above, but the fourth and fifth of oblique series are yellow; secondaries have a white dot in first median interspace.

Expanse, ♂ 44 millim., ♀ 48 millim.

Occurs in Western China, but appears to be scarce. I have three specimens, one example of each sex from Chia-kou-ho, and a female from Omei-shan; all were taken in July.

Closely allied to *P. austeni* from China, but is distinguished by having five spots in the oblique series on the upper surface of primaries and a white dot on under surface of secondaries; it is also not so dark in ground-colour, and is clothed with yellowish hairs.

* Trans. Ent. Soc. Lond. 1888, p. 448.

Parnara cærulescens. (Plate XLII. fig. 9, ♂.)

Pamphila cærulescens, Mabille, Ann. Ent. Soc. Fr. 1876, p. 1v.

"Magna, tota nigro-fusca (femina); alis anticis ad basia subolivaceis, cum 7 punctis fenestrato-albis; quorum parvum unum in cellula extrema ad costam, tria approximata ante apicem, tria alia obliqua in disco: sex illa angulatam lineam efformant. Alis posticis immaculatis, fimbria pallide cinerea in mare, nigro-cinerea in femina. Alis anticis subtus concoloribus sed rufescentibus, et in femina intensius; posticis rufo-fuscis, sinuatis, margine anali fusco, cum serie discali sex punctorum in mare pallide, in femina nitide cæruleorum, puncto secundo extra seriem procedenti ad marginem externum." (*Mabille, l. c.*)

The discoidal spot of primaries varies in size and is sometimes entirely absent. A fairly common species in June and July, up to 6000 feet, at Wa-ssu-kow, Chia-kou-ho, Ta-chien-lu, Moupin, Wa-shan, and Pu-tsu-fong. The type was taken by l'Abbé David.

Parnara sarala. (Plate XXXVIII. fig. 11, ♂.)

Parnara sarala, de Nicéville, Bomb. Nat. Hist. Journ. iv. p. 173, pl. B. fig. 6, ♀ (1889).

"Female. Upperside, both wings dark bronzy fuscous. Fore wing with a large medially constricted spot at the end of the cell; an elongated spot at the base of the second median interspace; a much larger one towards the base of the first median interspace, its outer end concave, its inner end convex, anteriorly and posteriorly touching the second and first median nervules; a comma-shaped spot in the submedian interspace, touching the middle of the submedian nerve—all these spots semitransparent lustrous white; cilia fuscous. Hind wing with a large oval pale yellow patch on the middle of the disc; and a small patch on the abdominal margin near the base of the wing; cilia rich chrome-yellow at the anal angle, gradually shading off into fuscous anteriorly. Underside, both wings distinctly glossed with rich purple. Fore wing with the three discal spots as above, the one in the submedian interspace on the upperside developed into a large outwardly diffused white patch, occupying the middle of the inner margin; a large chrome-yellow quadrate patch above the spot in the cell extending from the subcostal nerve to the costa. Hind wing with the oval pale yellow discal patch of the upperside developed into a broad anteriorly-increasing discal chrome-yellow band, extending from the abdominal margin to the costa, but with a break between the submedian and internal nervures. Palpi, thorax, and abdomen above and below clothed with bronzy-green iridescent hairs; antennæ with shaft black, club broken off.

"Expanse ♀ 2.0 inches. Khasi Hills." (*de Nicéville, l. c.*)

I received two male specimens from Western China, one was captured at Moupin and the other at Omei-shan—both in July.

These Chinese male examples differ from the Indian female specimen as figured by de Nicéville in the following characters:—the spots on primaries are smaller, and the fascia on upper surface of the secondaries is whiter, narrower, and more widely interrupted.

Mr. de Nicéville (*l. c.*) says:—"The Rev. Walter A. Hamilton, who obtained the two specimens above described, possesses the wings only of a third specimen, placed between tale, of what appears to be the male of this species captured in the same locality. In the fore wing there are two small well-separated spots in the cell instead of one large one, the two spots below are smaller, the spot on the submedian interspace entirely wanting; otherwise as in the female. This specimen does not apparently possess any secondary sexual characters.

"I do not know any near ally to *P. sarala*. The shape of the wings agrees with that of the species of the genus *Parnara*, the probable male having the fore wing less broad, the apex more acute, and the outer margin more straight and inwardly oblique than in the female."

These differences in shape are not apparent in my male specimen compared with de Nicéville's figure of the female.

The species is here retained in *Paruara*, as it has been placed therein by de Nicéville, but a new genus will probably have to be created for it.

Genus BAORIS.

Baoris, Moore, Lep. Ceyl. i. p. 165 (1881).

"Fore wing triangular, apex acute; exterior margin very oblique; hind wing broad, very convex anteriorly, the male possessing a more or less prominent tuft of long hair covering a patch of raised scales at end of the cell. Body robust, thorax very broad; club of antennae somewhat lengthened.

"Type, *B. (Hesperia) oceia*, Hewitson." (*Moore, l. c.*)

Baoris oceia. (Plate XLII. fig. 6, ♂.)

Hesperia oceia, Hewitson, Desc. Hesp. p. 31 (1868).

Baoris oceia, Moore, Lep. Ceyl. p. 165 (1881).

"Alis fuscis; anticis maculis vitreis; posticis plaga ovali media rugoso-squamosa, setis longis nigris decumbentibus obtecta.

"Upperside dark rufous-brown. Anterior wing with seven transparent spots: two, very small, within the cell, three between the nervures below these, and two before the apex. Posterior wing with a large tuft of black hair below the costal margin.

"Expanse $1\frac{9}{10}$ inch. Philippines." (*Hewitson, l. c.*)

I have received this species from Omei-shan, Western China, and from Kiukiang, Central China. I took specimens myself at Foochau and Ningpo in April. All these agree fairly well with Sikkim examples in my collection,

but there is no tendency to vary in the direction of the unicolorous form met with in the latter locality, which Moore has named *B. unicolor**, and de Nicéville has figured as a female variety of *B. occia* †.

Elwes (Trans. Ent. Soc. Lond. 1888, p. 443) states that *B. occia* is common in Sikkim, from 4000 to 5000 feet, throughout the greater part of the season, and is very variable in the number of the spots. He considers *B. scapulifera*, Moore, to be referable to *B. occia*.

Distribution. Philippines, Calcutta, Burmah, Sikkim, Pegu, Northern China.

Genus AEROMACHIUS.

Aeromachus, de Nicéville, Journ. Bomb. Nat. Hist. Soc. v. p. 214 (1890); Watson, Proc. Zool. Soc. Lond. 1893, p. 80.

- “ Both wings very small. Fore wing triangular, costa quite straight, apex acute, outer margin gently convex, inner angle rounded, inner margin straight, longer than the outer margin; costal nervure ending about opposite the apex of the discoidal cell, well separated from the costa, bent upwards to the costa towards its end; base of second subcostal nervule nearer to base of first than to base of third, fourth subcostal arising very near to the base of the third, reaching the apex of the wing; terminal portion of subcostal nervure (often called a fifth subcostal nervule) ending on the outer margin considerably below the apex of the wing; upper discocellular nervule short, stout, outwardly oblique, straight; middle discocellular sinuous; lower discocellular shorter than the middle, straight, on the same straight line with the middle, inwardly oblique; the median nervules with their bases equidistant, given off very near to the end of the cell, the third median originating at the point where the lower discocellular nervule meets the median nervure; the median nervure strongly bent upwards from the base of the second median nervule; submedian nervure straight.
- “ *Male* (in the type species only) with a broad oblique stripe of modified scales on the upperside, extending from the middle of the submedian nervure to the base of the second median nervule. Hind wing, much rounded throughout; costa short; costal nervure almost straight, first subcostal nervule bent upwards at base, thence straight to apex of wing; subcostal nervure strongly bent downwards between the bases of the subcostal nervules, giving the appearance of a third (or upper) discocellular nervule, the subcostal nervure and its branches together forming a figure of almost the exact shape of a tuning-fork; discocellular nervules outwardly oblique, the upper concave, the lower shorter than the upper; the discoidal nervule curved, and like the discocellular nervules, very fine but perfectly distinct; second median nervule given off some little distance before the lower end of the discoidal cell, more than twice as far from the base of the first as it is from the base of the third median; all three median nervules, however, arising near to the lower end of the cell; submedian and internal

* Proc. Zool. Soc. Lond. 1883, p. 533.

† Journ. Asiat. Soc. Beng. lii. p. 85, pl. x. fig. 11 (1883).

nervures straight. Antennæ exactly half the length of the costa of the fore wing, with a well-formed club, the tip slightly hooked; thorax rather slender, abdomen very slender.

"*Female* differs from the male in having the wings broader and more rounded, and lacks in the type species the patch of androconia on the upperside of the fore wing.

"Type, '*Thanaos' stigmata*, Moore." (*de Nicéville, l. c.*)

***Aeromachus piceus*, sp. nov.** (Plate XLI. fig. 16, ♂.)

Male. Fuliginous: fringes pale greyish, chequered with darker at ends of the nervules. The male has a narrow oblique patch of black raised scales on primaries. Under surface greyish brown: primaries are sprinkled with ochreous along the costal area, and have central and submarginal series of whitish spots, extending from costa to first median nervule; secondaries are sprinkled with ochreous, and traversed by two series of whitish spots extending from subcostal to submedian veins.

Expanse 28 millim.

I have two males which were taken at Moupin in June.

Closely allied to *A. (T.) stigmata*, Moore*, from which it differs in not having a discal series of pale spots on upper surface of primaries and in the macular bands on under surface of secondaries being differently placed.

***Aeromachus catocyaneus*.**

Pamphila catocyanea, Mabille, Ann. Soc. Ent. France, 1876, p. lv.

"Mas alis fuscis, fimbria sordida. Anticis cum striga nigra, brevi, squamis cinereis distincta, a cellula usque ad nervum simplicem inferiorem, obliqua. Anticæ subtus fusce, cum lineola vix conspicua in cellula et duabus lineis punctorum cæruleorum, altera discali, altera marginali inferius evanida. Posticæ cum tribus lineis punctorum viridius cæruleorum, una interrupta in basi, secunda discali punctorum majorum, tertia marginali, punctis ejus ad angulum analem majoribus: lineæ discalis puncta 5a sunt approximata ut dici possint fascia macularum elongatarum nervis divisarum: pectus et caput pilis olivaceis hirsuta. Pagina superiorum *P. nasonia* refert, at minor ille noster.

"Thibet, Abb. Arn. David. Mus. Nat." (*Mabille, l. c.*)

Agrees in general appearance with *A. (T.) kali*, de Nicéville, from Sikkim (Journ. Asiat. Soc. Beng. 1885, p. 123, pl. ii. fig. 3, ♂), but it differs in having the bluish macular bands of under surface more clearly defined and gently curved instead of angulated. In a carefully executed hand-coloured drawing of the male type of *A. catocyaneus*, the primaries appear to have a transverse dark-coloured patch, but there is no mention of any such mark in the description of that insect. Neither is this mark referred to as a character of *A. kali*.

* Proc. Zool. Soc. Lond. 1878, p. 694.

Judging from the figure referred to, this species appears to be congeneric with *A. piceus*, and I have therefore placed it in *Aeromachus*.

This species was not obtained by my collectors in any part of China that they visited. The upper surface is unicolorous, but the under surface is conspicuous in having central and marginal bands of blue spots on all the wings, and some blue markings at base of secondaries.

It is to be hoped that M. Poncelet will find an opportunity of figuring this species, and also *Halpe lucasi*, in an early part of his 'Novitates Lepidopterologicae.'

Aeromachus inachus. (Plate XL. fig. 19, ♂.)

Pyrgus inachus, Ménétrics, Bull. Acad. Petr. xvii. p. 217 (1859); Schrenck's Reisen, p. 46, pl. iv. fig. 2 (1859); Pryer, Rhop. Nihon. p. 35, pl. x. fig. 20 (1889).

"Alis violaceo-fuscis, nitidis; anticis striga angulato-flexuosa e maculis minutissimis albis; subtis virescente-pubescentibus, posticis lineis duabus albidis obsoletis.

"Eaverg. 10 lign.

"Cette espèce est plus petite que le *P. serrator*, Ramb., auprès de laquelle elle vient se placer.

"En dessus, les ailes sont d'un brun un peu violet et luisant, n'ayant pour tout dessin, que sur les supérieures une ligne coudée en dedans et formée de très petites taches blanches très rapprochées.

"En dessous, la teinte générale est un peu plus claire, et les ailes sont couvertes d'une pubescence verdâtre, surtout sur le bord antérieur des premières ailes et la moitié antérieure des secondes. Les ailes supérieures présentent la ligne maculaire du dessus, bien marquée, et de plus, on remarque près du sommet quatre à cinq taches peu apparentes disposées en ligne le long du bord externe. Les ailes inférieures laissent apercevoir la trace de deux bandes circulaires, formées de taches blanchâtres, ainsi que quelques autres taches à peine distinctes placées sur le disque. Les ailes ont leur frange alternativement blanche et brune, comme on l'observe chez les espèces voisines. Le corps est brun en dessus, et couvert de poils verdâtres, mais le dessous et les côtés des cinq derniers articles de l'abdomen sont bordés de blanc grisâtre; la poitrine est noire, couverte de poils grisâtres.

"D'après un seul individu rapporté par M. Maack, des bords de l'Amour non loin de l'embouchure du Ssongari." (*Ménétrics, Schrenck's Reisen.*)

In some examples the white spots of upper surface are almost entirely obsolete.

Pryer (*l. c.*) states that this species occurs at Nikko and Asamayama, but is scarce at the former place.

I have received specimens from Ta-chien-lu, Huang-mu-chang, Wa-shan, Wa-ssu-kow, and Chow-pin-sa in Western China, where they occurred in July and August up to an elevation of 8000 to 10,000 feet. Mr. W. B. Pryer took the species at Ningpo, and Herz met with it in N. China and the

Corea. It seems to be a scarce insect in Amurland. I have placed this species in *Aeromachus* because it seems to agree with *A. jhora*, de Nicéville.

Distribution. Amurland, Corea, Northern and Western China, Japan.

Aeromachus delai-lama. (Plate XL. fig. 16, ♂.)

Cyclopides delai-lama, Mabile, Ann. Soc. Ent. Fr. 1876, p. lvi.

Taractrocera lyde, Leech, Entomologist, xxiv., Suppl. p. 60 (1891).

"Nigro-fuscus, alis anticis 7 et 8 puncta ferentibus in disco: tria ad apicem elongata (in femina quatuor, quarto minimo, rotundato), coadunata, bina ad medium marginem externum; et bina alia in cellula, fulva. Alis posticis serie discali 3-4 punctorum fulvorum, et puncto simili, parvo in cellula, saepius in mare cyanido. Alæ subtus squamis flavidis irroratæ, nisi in disco et in margine interno anticarum; in anticis puncta majora, apicaliaque discalibus juncta aliis minimis, quibus ita efformatur fascia; altera fascia ex apice sequitur marginem et ad medium vanescit. Posticæ magis irroratæ, cum puncto costali et tribus lineis punctorum flavorum, hæc basali, illa discali, et tertia vix conspicua marginali. Corpus flavido subtus irroratum, nec non pedes et palpi." (*Mabile, l. c.*)

Brownish black; markings rich yellow arranged as follows:—a large spot at outer extremity of the cell of primaries with a dot above it, an interrupted band, consisting of four spots towards apex, below which are two (sometimes three) other spots about the centre of the wing; these spots would be confluent if it were not for the dark neurulation; on the secondaries there is a discal spot, followed by a central band formed of yellow spots. Fringes greyish white, chequered with black. Under surface of primaries as above, but sprinkled along the costa with yellowish scales; there is also a row of spots on outer margin from the apex: secondaries thickly sprinkled with yellow scales; in addition to the markings of the upper surface there are two basal spots, and also a series of spots along the outer margin. The female agrees with the male, but on the under surface the secondaries and costal area of primaries are suffused with orange, the markings being of a paler shade.

Expanse, ♂ 25 millim., ♀ 30 millim.

Occurs in June and July at Moupin, Wa-ssu-kow, and Chia-kou-ho, Western China, and, according to Mabile, in Thibet.

Aeromachus nanus. (Plate XL. fig. 21, ♂.)

Cyclopides nanus, Leech, Entomologist, xxiii. p. 49 (1890).

Fulginous brown. Primaries have six small yellowish spots, one discoidal, and a transverse series of five beyond, two of which occupy the median interspace, and three near costa. Fringes of secondaries and towards inner margin of primaries whitish, spotted with brownish. Under surface of primaries as above, with the addition of a broad stripe of yellowish scales along the costa, and some yellowish patches below apex: secondaries are thickly sprinkled with yellowish, especially on the basal half, which is divided into two parts by a dark transverse line just beyond a pale yellowish discoidal spot, there are central and submarginal series of pale yellow spots; fringes as above.

Expanse 21 millim.

Seven specimens, including two examples of the female, taken at Ichang in June. One of the females has the number of spots in the submarginal series on underside of primaries increased to six by the addition of one to the costal set.

I also received specimens of this species from a native collector at Ningpo, in 1886.

Genus HALPE.

Halpe, Moore, Proc. Zool. Soc. Lond. 1878, p. 689; Watson, Proc. Zool. Soc. Lond. 1893, p. 108.

“Allied to *Pamphila* (*P. sylwanis*). Antennæ with a more slender club and longer hook at tip. Fore wing shorter; exterior margin more convex: the discal oblique series of raised scales in male shorter and broader. Head and thorax smaller; abdomen slender. Veins similar, the lower median branch being nearer end of the cell.” (*Moore, l. c.*)

“Type *betaria*, Hew.

“Antennæ: club moderate, elongate, with a short apical crook, tip acuminate. Palpi porrect; third joint minute, obtusely conical. Fore wing: inner margin longer than outer margin; cell of fore wing less than two thirds the length of costa; vein 12 reaching costa before the end of cell; upper discocellular about twice the length of lower; vein 5 considerably nearer to 4 than to 6; vein 3 well before end of cell, about equidistant from 2 and from 4; vein 2 nearer to end of cell than to base of wing. Hind wing evenly rounded: cell very short; vein 7 well before end of cell, at its origin vein 7 is sharply bent upwards, and the upper margin of the cell is bent downwards so that the angle is shaped like a tuning-fork; discocellulars faint; vein 5 not traceable; vein 3 from end of cell; vein 2 very much nearer to end of cell than to base of wing; lower margin of cell slightly angled at vein 2. The above is the neuration of the male; in the female vein 3 of the fore wing is slightly nearer to end of cell, and on the hind wing vein 7 arises at an acute angle with the upper margin of cell. Hind tibiae slightly fringed and with two pairs of spurs. In most species the male is provided with a linear discal stigma on the fore wing, running obliquely from the origin of vein 3 almost to the inner margin. In those species in which there is no discal stigma, the neuration of both wings of the male agrees with that of the female.

“Confined to Southern Asia and Japan.” (*Watson, l. c.*)

Halpe varia. (Plate XLII. fig. 18, ♂.)

Pamphila varia, Murray, Ent. Mo. Mag. xi. p. 172 (1875); Pryer, Rhop. Nihon. p. 33, pl. x. fig. 9 (1889).

Male. Alis supra brunneis, anticis margine exteriore rectiusculâ, maculis quatuor minimis (unâ in cellula elongata). Posticis inmaeuclatis. Alis subtus ochraceis (anticis ad marginem interiorem brunneis) venis nigris, anticis maculis duabus discocellularibus (inferiore majore), alteris duabus in regione exteriore, maculâ sub-apicali tripartitâ, lineâque anteciliari nigrâ. Posticis maculâ obsoletâ basali, maculâ inter ramos sub-costales sub-flavâ, alteris duabus inter ramos medianos, lineâque anteciliari nigrâ. Ciliis albis, ad apicem antearum obsolete nigromaculatis.

"*Female*. Alis anticis (marginē exteriore convexā) maculis conspicuis (duabus discocellularibus) maculā sub-apicali tripartita, alteris duabus in regione exteriore, strigāque minimā super marginem interiorem. Posticis immaculatis. Subtus ut in mare. Ciliis albis, ad apicem anticarum nigro-maculatis.

"Alar. exp. ♂ 1" 4", ♀ 1" 6". *Hab.* Japoniam." (*Murray, l. c.*)

This species, which is easily recognized by the dark veins on the under surface of the secondaries, appears to be peculiar to Japan. It is widely distributed in that country, but not common. I have specimens from Satsuma, Nagasaki, Tsuruga, Hakodate, and Yokohama.

Halpe submacula. (Plate XLII. fig. 13, ♂.)

Halpe submacula, Leech, Entomologist, xxiii. p. 48 (1890).

Male. Dark brown. Primaries have a double subhyaline spot in discoidal cell, one in each median interspace beyond, and three forming a short oblique dash just below costa and near apex; there are also two small obscure yellowish spots below the discoidal cell. Secondaries have three central subhyaline spots, two of these are only separated by the second median nervule, and the third is nearer the costa. Under surface dark brown, clouded with yellowish, discal central and costal subhyaline spots as above, but tinged with yellow; the costa is streaked with ochreous to the middle, and there is a submarginal series of ochreous spots extending to first median: secondaries are brown, sprinkled with ochreous scales, with a pale yellowish spot near base of costal nerve, another nearer its middle, and one at its external extremity, the last constitutes the initial spot of a submarginal series of double pale yellow spots, the third of which represents the terminal spot of three, forming a longitudinal streak from the base of the wing; another longitudinal streak below is in connection with the last spot of submarginal series, but its junction therewith is obscured by some blackish markings; fringes of both surfaces pale yellow, chequered with blackish.

Expanse 38-40 millim.

Occurs at Chang-yang and Chia-ting-fu in June and July.

Halpe nephele, sp. nov. (Plate XLII. fig. 15, ♂.)

Male. Blackish, sparsely powdered with ochreous grey on basal area of primaries; these wings have six whitish subhyaline spots placed as follows:—one in the discoidal cell; three sub-apical, that near the costa very minute; one in each median interspace. Secondaries have two short parallel whitish central dashes. Fringes whitish, chequered with blackish at ends of nervules. Under surface fuliginous, powdered and suffused with yellowish on costal and apical areas of primaries and the whole of secondaries: primaries have the spots as above, and also a submarginal series of pale spots; sexual brand reproduced and edged with white at its lower extremity; secondaries have subbasal, central, and submarginal series of creamy spots, of which the second and third of central series are the largest. Antennæ black above, ringed with pale yellowish beneath; club has the basal portion yellow, and the apical portion dingy castaneous.

Female. Similar to the male, but with a small more or less triangular whitish spot in the submedian interspace resting against the nervure.

Expanse 40 millim.

Occurs in Western China in June and July. I have received specimens from Omei-shan, Wa-ssu-kow, Chia-ting-fu, and Kwei-chow.

Halpe latris, sp. nov. (Plate XLII. fig. 17, ♂.)

Male. Fuliginous, powdered with ochreous, especially on the basal and inner marginal areas of primaries and discal area of secondaries, the latter with some long silky hairs of the same colour. Primaries have seven subdiaphanous creamy spots placed as follows:—two at end of the discoidal cell, one in each median interspace, and three subapical, the costal one minute. Sexual brand well defined, but not conspicuous. Fringes whitish grey, those of primaries chequered with the ground-colour, and those of secondaries tinted with yellow towards outer angle. Under surface fuliginous, costa and apical third deeply suffused with ochreous brown; spots as above, but suffused with dusky; there are indications of the sexual brand, the lower preceded by a whitish longitudinal dash; secondaries ochreous brown with a whitish spot in each median interspace, and one above towards costa; following these spots there are some pale elongate marks; submedian interspace has a fuliginous streak increasing in width towards outer margin; fringes as above, but those of secondaries are more strongly chequered in the middle. Antennæ black above, shaft ringed with buff beneath; clubs tipped with castaneous.

Expanse 34 millim.

Occurs at Ta-chien-lu in July, but appears to be scarce.

This species is closely allied to *H. sitala*, de Nicéville (Journ. Asiat. Soc. Beng. 1885, p. 121, pl. ii. fig. 5, ♂), from S. India, but differs chiefly in having a blackish triangular streak in the submedian interspace on under surface of secondaries.

Halpe bivitta.

Pamphila bivitta, Oberthür, Etud. d'Entom. xi. p. 28, pl. vi. fig. 46 (1886).

“Les quatre ailes en dessus sont brunes, entourées d'une frange plus claire qui est entrecoupée de noirâtre aux ailes supérieures dont l'apex est plus obscur que le fond des ailes. Une tache cellulaire, trois subapicales juxtaposées et deux intracellulaires en échelon, jaunâtres, avec un reflet brillant qui leur donne une apparence vitreuse, sont les seules qui contiennent les ailes supérieures en dessus; les inférieures sont sans aucune tache. Mais il y a chez le mâle aux ailes supérieures, au-dessous de la tache cellulaire jaunâtre, une sorte de bouton velu jaunâtre.

“Dessous brun rougeâtre, sauf le disque des supérieures qui est noirâtre; celles-ci reproduisant les taches du dessus et en outre ornées d'une rangée maculaire, submarginale, jaune pâle mat, qui descend droit du bord costal vers le bord inférieur. Les ailes inférieures sont pourvues de deux traits argentés, droits, nets, assez longs; l'un d'eux est surmonté d'une petite tache

basilaire allongée, également argentée, et il y a deux petites taches de même couleur, l'une submarginale, entre les deux longs traits, l'autre au-dessous du trait inférieur.

"Les pattes sont jaune d'ocre. Les antennes sont finement annelées de blanchâtre et de brun en dessus; elles sont ochracées en dessous." (*Oberthür, l. c.*)

Not uncommon in Western China at Ta-chien-lu, Wa-ssu-kow, Pu-tsu-fong, and Chia-kon-ho, in May, June, and July.

In his explanation of plates, Etud. xi. p. 38, M. Oberthür refers to this insect as *albivitta*.

Halpe gupta. (Plate XLII. fig. 20, ♂.)

Halpe gupta, de Nicéville, Journ. Asiat. Soc. Beng. lv. p. 254, pl. xi. fig. 1, ♂ (1886).

"*Mal.* Upperside, both wings dark brown. Fore wing with two small spots in the cell placed obliquely one above the other, obsolete in one specimen, two or three conjoined subapical minute spots, two on the disc divided by the second median nervule. Hind wing with some long ochreous hairs in the middle of the disc. Upperside, fore wing with the costa and apex diminishing towards the anal angle, and the whole of the hind wing clothed with greenish-ochreous scales. Fore wing marked as above. Hind wing with two or three small pale opaque spots on the disc. Cilia cinereous, tipped with darker at the ends of the nervules.

"Expanse ♂ 1.4 to 1.5 inches.

"*Hab.* Sikkim.

"Near to *H. kunara*, mihi, differs somewhat in shape, the fore wing being narrower and more produced at the apex, the subapical spots smaller. On the underside in *H. gupta* there are some pale spots on the disc of the hind wing, which are absent in *H. kunara*. The shade of the ground-colour is also quite different: in *H. kunara* it is golden brown, in *H. gupta* greenish ochreous. The sexual mark is rather prominent. Mr. Otto Möller has obtained several male specimens in Sikkim." (*de Nicéville, l. c.*)

I have two male specimens from Wa-ssu-kow, Western China, where they were taken in July at an elevation of 5000 feet. These differ from a series of twelve specimens (including the type) from Sikkim in the late Otto Möller's collection in being greyer on the under surface, and the spots on the under surface of the secondaries are rather more elongate.

The peculiar character of the sexual brand in this species at once separates it from any other known to me.

Halpe lucasi.

Hesperilla lucasi, Mabille, Ann. Soc. Ent. France, 1876, p. cliii.

"Nigro-olivacea, alis anticis 5-6 puncta gerentibus, unum elongato-quadratum in extrema cellula, duo apicem versus in mare, tria in femina, parva et duo obliqua infra punctum cellulare, strigæ nigre marginem internum attingenti conjuncta omnia rufecola, subhyalina; fimbria

rufcola intersecta. Alis anticis subtus apice et costa vivide rufis; posticis totis olivaceo-rufis cum serie macularum in disco saepius obsoletarum, margine externo obscuriori.

“Moupin (Abb. Arm. David). Mus. Nat.” (*Mabille, l. c.*)

My collectors failed to meet with this species. Its distinctive character appears to be a central series of four black spots on under surface of secondaries.

This species is allied to *H. humara*, de Nicéville (Journ. Asiat. Soc. Beng. 1885, p. 121, pl. ii. fig. 10, ♂), but differs in having a double spot in discoidal cell, and the secondaries are more elongate in shape.

Halpe cænis, sp. nov. (Plate XLII. fig. 16, ♂.)

Male. Blackish brown, clothed about the base of primaries and disc of secondaries with fulvous hairs. Sexual brand well defined; there are six white spots on primaries placed as in *H. varia*, Murray, but that at end of cell is double. Under surface of primaries fuliginous, much suffused with ochreous brown about costa and apex, spots as above; secondaries ochreous brown, with very faint indications of white central spots. Fringes whitish above, greyish beneath, with faint chequering. Antennæ black above, ringed beneath with yellow; club yellow beneath, tipped with castaneous.

Expanse 40 millim.

One male specimen taken in Western China at Chia-kou-ho in August.

Halpe blanchardi. (Plate XLII. fig. 19, ♂.)

Hesperilla blanchardii, Mabille, Ann. Soc. Ent. France, 1876, p. cliii.

“Præcedenti simillima [*H. lucasi*]; sed punctum cellule geminatum et duplex aliquoties; puncta apicalia tria, supremum minimum. Fimbria rufcola, continua simplex non intersecta. Subtus subobscurior cum 4 punctis luteis, duobus in disco et duobus alteris minimis ad marginem anticum.

“Moupin.” (*Mabille, l. c.*)

I have six male specimens from Pu-tsu-fong and Wa-ssu-kow.

These examples differ from a hand-coloured drawing of Mabille's type in having the primaries dusted with yellow towards base, and the under surface is much more ochreous.

Halpe subflava, sp. nov. (Plate XLII. fig. 21, ♂.)

Male. Fuliginous brown. The primaries, which are sparingly powdered with ochreous on costal area, have six small semitransparent spots placed as follows:—two, colon-like, in discoidal cell; two towards apex, and one in each median interspace. The sexual brand is well formed but not conspicuous. Secondaries have some long silky ochreous hairs on discal area, but are without spots. Fringes white, those of primaries slightly suffused with dusky from

below the apex, and those of secondaries yellow at outer angle. Under surface of primaries fuliginous, with the costal, apical, and inner marginal areas broadly yellowish; spots as above but, excepting the pair in discoidal cell, followed by black dots: secondaries yellowish, with a black spot in each median interspace, and a third towards costa (sometimes there is a fourth black spot in subcostal interspace); there is a fuliginous streak, increasing in width towards inner margin, in submedian interspace, this is sometimes edged above with whitish. Antennæ black, narrowly ringed with buff beneath; club with the basal portion buff and the apical portion brownish.

Expanse 31-34 millim.

I received six specimens, all males, of this species from Western China, where they were taken at Wa-ssu-kow, in July.

The subapical and discoidal spots are very minute, and in some examples the latter are united, forming a transverse linear spot. In one specimen, the largest in the series, all the spots are unusually small, and the upper subapical one is hardly discernible.

Genus NOTOCRYPTA.

Plesioneura, Felder, Wien. ent. Mon. vi. p. 29 (1862), nom. præoc.

Plesioneura, part., auctorum.

Notocrypta, de Nicéville, Bomb. Nat. Hist. Journ. iv. p. 188 (1889); Watson, Proc. Zool. Soc. Lond. 1893, p. 112.

"Differs from *Celruochinus*, Hübnér, in the fore wing being more triangular, the middle discocellular nervule being distinctly longer instead of shorter than the lower discocellular, concave instead of almost straight, the middle and lower discocellular nervules taken together less strongly inwardly oblique; the hind wing is also shorter and more produced posteriorly and the costa is much arched, the discoidal cell is distinctly shorter, thus causing all the veins which spring from it (the first and second subcostal, the discoidal, and the three median nervules) to be distinctly longer. There is a marked difference in the length of the haustellum or tongue, which in *C. leucocera*, Kollar, measures 1.8 inches, in *N. alyss*, Moore, only .9 of an inch, or exactly half.

"Type, the *Plesioneura curvifascia* of Felder." (*de Nicéville, l. c.*)

Notocrypta curvifascia. (Plate XXXVIII. fig. 1, ♂.)

Plesioneura curvifascia, Felder, Wien. ent. Mon. vi. p. 29 (1862).

Notocrypta curvifascia, de Nicéville, Bomb. Nat. Hist. Journ. 1889, p. 188.

"Alis supra fuscis, anticis utrinque fascia discali curvata, introrsum incisa punctisque hyalino-albis, subtus omnium limbo externo posticurarumque dimidio basali lilascenti-cano atomatis. ♂.

"Ning-po.—Sat affinis *P. feisthameli*, Boisd., vulgari speciei Indiarum et insularum Archipelagi Malayici incolorati et forte subspecies ejus geographica. Alæ longiores sunt et fascia alarum anticarum angustior, infra ramum medianum primum profunde incisa ideoque curvata." (*Felder, l. c.*)

This species can be readily separated from *N. feisthameli* by the three,

sometimes four, subapical spots on the under surface of primaries, which are connected with the costa by two pale dashes. It seems to be a fairly constant species, the only variation noticeable being the curvature of fascia, and the occasional absence of one or two of the outer white dots on primaries.

I met with it commonly in May in a small ravine close to the sea near the port for Kumamoto, in Kiushiu. I also took it at Ningpo and Foochau, in April, and have received it from Chow-pin-sa, Wa-shan, and Chia-ting-fu, in Western China. Felder's type was from Ningpo.

Notocrypta restricta. (Plate XXXVIII. fig. 3, ♂.)

Plesioneura restricta, Moore, Lep. Ceyl. i. p. 178 (1881); Wood-Mason & de Nicéville, Journ. Asiat. Soc. Beng. 1887, p. 390, pl. xvii. fig. 5, ♂.

Notocrypta restricta, de Nicéville, Bomb. Nat. Hist. Journ. 1889, p. 189.

"Allied to *P. alysos*: fore wing with similar transparent medial band, subapical spots, and also with a small linear spot between upper and middle median veins. Underside as above, with the band stopping at the subcostal vein in both sexes—not being continued in a white streak to the costal margin as in *alysos*." (Moore, l. c.)

Occurs at Chang-yang, Central China; Omei-shan, Western China; Pryer took it in the Loochoo Islands.

The Chinese specimens agree very well with Sikkim examples, but are usually rather larger.

Distribution. India, Burmah, the Andamans, Cachar, Ceylon, Central and Western China, Loochoo Islands.

Notocrypta feisthameli. (Plate XXXVIII. fig. 2, var.)

Thymele feisthameli, Boisduval, Voy. Astr., Lép. p. 159, pl. ii. fig. 7 (1832).

Plesioneura alysos, Moore, Proc. Zool. Soc. Lond. 1865, p. 789; Lep. Ceyl. i. p. 178, pl. lxvii. figs. 3 ♂, 3 ♀, 3 ♂ larv. & pup. (1881); Distant, Rhop. Malay. p. 399, pl. xxxiv. fig. 7, ♂ (1886).

Notocrypta alysos, de Nicéville, Bomb. Nat. Hist. Journ. 1889, p. 189.

"Upside dark vinous brown. Male: fore wing with a semitransparent, oblique, transverse, irregular-shaped medial band, with either one or two very small oblique subapical spots, and a lower spot between the upper median and radial. Female: fore wing with broader medial band, three subapical spots, the spot between upper median and radial, and sometimes another between the upper and middle medians. Palpi and thorax beneath olive-brown. Antennæ with a white streak near apex. Underside paler: fore wing with medial band and subapical spots as above, and with a white costal streak above the band: hind wing fasciated transversely with grey scales.

"Expanse, ♂ $1\frac{5}{8}$, ♀ $1\frac{7}{8}$ inch.

"Larva pale green, white-speckled; head black-bordered. Feeds on *Zinziberaceæ*. *Pupa* pale green." (Moore, *Lep. Ceyl.*)

Occurs in Western China at Omei-shan and Moupin in July.

The Chinese specimens are always larger than typical examples; the fascia is broader and straighter, and they have well-defined submarginal spots. This form may be known as var. *rectifascia* (Plate XXXVIII. fig. 2, ♂).

N. feisthameli (alysos) can be at once distinguished from the two preceding species by the dull whitish patch on the under surface of primaries which connects the white fascia with the costa.

Elwes (Proc. Zool. Soc. Lond. 1888, p. 461) places *N. paralyzos*, Wood-Mason & de Nicéville, as a synonym of this species, which he states is common in Sikkim, up to 4000 or 5000 feet, from March to December.

Distribution. Continental India, Ceylon, Andaman Islands, Malay Peninsula, Malacca, Java, and China.

Notocrypta goto. (Plate XXXVIII. fig. 4, ♂.)

Plesioneura goto, Mabille, Ann. Soc. Ent. Belg. xxvii. p. lvi (1883).

"Vicina *P. ruficorni*, Mab., javana, et statura *schemæ*, Hew.

"Alæ anticæ nigre cum tribus punctis albedo-hyalinis ad apicem et fascia lata, costam non tangente, e tribus maculis composita: intermedia anguliformis excedit cæteras extrorsum. Alæ posticæ immaculatæ, basi rufescenti.

"E Japonia.

"Cette espèce a la bande des supérieures courte, ramassée en une tache carrée, compacte; la tache médiane, en triangle étroit, dépasse extérieurement les autres. Entre la côte et l'extrémité de la bande blanche, il y a deux taches jaunâtres, plus visibles en dessous." (*Mabille, l. c.*)

I am indebted to M. Mabille for the loan of the type (the only example known) of this species, which is figured in this work. It is a very bad specimen, and when fresh the insect was probably very much darker in colour. It seems nearest allied to *N. (Plesioneura) nigricans*, de Nicéville*, from Sikkim.

Habitat. Japan.

Notocrypta tibetana. (Plate XXXVIII. fig. 6, ♂.)

Pterygospidea tibetana, Mabille, Ann. Soc. Ent. France, 1876, p. liv.

"Nigra; alis nigris, anticis fascia lata ntrinque sinuato-angulata, semicurva, a costa usque ad

* Journ. Asiat. Soc. Beng. 1855, p. 123, pl. ii. fig. 6, ♀.

angulum internum, sericeo-alba, et tribus punctis coadmnatis ad apicem, duobusque aliis infra apicalia, minutis, saepius nullis, praesertim in femina; fimbria obscure grisea. Posticis nigris, fimbria alba, ad apicem latiore, subintersecta, nigra. Subtus antice similes; faseja antecostam nigram lutescit. Posticæ squamis griseis pulverulente, cum puncto discali, et serie punctorum albidorum antemarginali. Pedes cinerei; palpi albi.

“Thibet (Abb. Arm. David). Mus. Nat.” (*Mabille, l. c.*)

Occurs at Ta-chien-lu, Pu-tsu-fong, Moupin, Wa-shan, and Chow-pin-sa, in Western China, and appears to be a common insect up to an elevation of 8000 feet.

This species is allied to *P. dhanada*, Moore (Proc. Zool. Soc. Lond. 1865, p. 789).

Genus ASTICTOPTERUS.

Astictopterus, Felder, Wien. ent. Mon. iv. p. 401 (1860); Watson, Proc. Zool. Soc. Lond. 1893, p. 114. Type, *jama*, Felder.

“Antennæ: club slender, tip recurved, acuminate. Palpi porrect; third joint short, obtusely conical. Fore wing: inner margin longer than outer margin; cell less than two thirds the length of costa; vein 12 reaching costa before end of cell; vein 11 curving upwards shortly after its origin and running close to, but not touching, vein 12; middle discocellular considerably longer than lower one; vein 5 much nearer to 4 than to 6, but not from close to bottom of cell; vein 3 well before end of cell, more than twice as far from 2 as from 4; vein 2 slightly nearer to 3 than to base of wing. Hind wing evenly rounded; vein 7 shortly before end of cell; discocellulars and vein 5 very faint; vein 3 shortly before end of cell, twice as far from 2 as from 4; vein 2 nearer to end of cell than to base of wing. Hind tibiae naked and with two pairs of long spurs.” (*Watson, l. c.*)

Astictopterus olivascens. (Plate XLII. fig. 1, var.)

Astictopterus olivascens, Moore, Proc. Zool. Soc. Lond. 1878, p. 692; Wood-Mason & de Nicéville, Journ. Asiat. Soc. Beng. 1886, p. 381, pl. xviii. figs. 2, 2 a ♀.

Cyclopides chinensis, Lecch, Entomologist, xxiii. p. 48 (1890).

Steropes ubilis, Mabille, Ann. Soc. Ent. Belg. xxxv. p. lxiv (1891).

“Allied to *A. unicolor*, Brem. (Ménér. Catal. Mus. Pct., Lep. i. t. 5. f. 6), from Peking and Hong Kong, but of larger size. Upperside uniform glossy olive-brown. *Female* with a white, semidiaphanous, narrow subapical spot crossed by the fourth and fifth subcostal branches. Underside: *male* uniformly brown; hind wing sparsely grey-speckled; *female* with subapical spot on fore wing as above, the exterior margin grey-speckled; hind wing with three ill-defined, sparsely grey-speckled, transverse bands. Palpi, body, and legs beneath grey.

“Expanse $1\frac{6}{10}$ inch.” (*Moore, l. c.*)

Cyclopides chinensis, Lecch.—Brownish black. Primaries with a short white dash near costa and towards apex, broken up by the nervules into three spots. Under surface of primaries

brown, suffused with fuliginous over the discal area, upper half of outer margins bordered with greyish, white dash as above; secondaries brown, inner half thickly sprinkled with greyish scales, and traversed by two obscure darker bands. Fringes dark grey, both above and beneath.

Expanse, ♂ 32-34 millim., ♀ 36-40 millim.

Steropes nubilus, Mabille.—“ Brun noir uniforme; ailes supérieures avec trois points apicaux blancs, vitrés; frange gris cendré. Dessous des supérieures noirâtre; avec un espace ovale gris lilas à l'apex contre le bord externe. Ailes inférieures gris lilas, avec une zone courbe sur le milieu, noirâtre; une tache semblable se fondant avec la base qui est plus obscure. Corps noir; ventre gris.

“ ♂ 32 millim. Hong-Kong.” (*Mabille, l. c.*)

The white spots forming the costal dash vary in number from three to one; in some specimens, where three are present, they are very faint; and in others all the spots are entirely absent from both surfaces.

Common in the neighbourhood of Chang-yang and Ichang, Central China, and I have received the species from Chia-ting-fu, Western China. I took specimens at Foochau in April.

I find that my *Cyclopidæ chinensis* is identical with *Astictopterus olivascens*, Moore, an insect I was not acquainted with at the time that I drew up my description. It differs from the type of *olivascens* in being smaller and in having a well-defined fascia on under surface of secondaries; in Möller's collection there are, however, specimens in the series of *olivascens* from Sikkim which cannot be separated from my Chinese examples. *Steropes nubilus*, Mabille, is also referable to *olivascens*.

The example figured (Plate XLII, fig. 1, ♂) is a unicolorous form from Ichang, where it seems to occur in about equal numbers with the type.

The Indian localities are Salween, Moulmein, Darjiling (*Moore*). Mr. de Nicéville records one female from Tavoy, on the identification of Mr. Moore, and states that it is rare in the neighbourhood of Calcutta, where it occurs amongst grass in shade. He also mentions three males and two females from the forest near Silcui, Cachar, 11th to 29th July.

Genus APOSTICTOPTERUS, gen. nov.

Length of primaries rather more than twice their greatest width; the apex is obtuse; outer margin slightly rounded to third median nervule and from thence oblique; middle of inner margin slightly concave. Secondaries rounded; outer margin slightly concave before the obtuse anal angle. Neuration does not differ materially from that of *Astictopterus*. Antennæ

not quite half the length of primaries; clubs slender, slightly curved but not hooked. Palpi prominent, second joint tomentose, third joint nearly as long as the second, densely clothed with long scales which project beyond the tip. Thorax and body slender, the latter extending beyond the anal angle. Head almost as wide as the thorax.

Apostictopterus fuliginosus, sp. nov. (Plate XXXVIII. fig. 8, ♂.)

Male. Fuliginous brown; primaries on upper surface dusted with ochreous on basal area and tinged with purple in certain lights.

Expanse 58 millim.

Occurs in Western China, whence I received one specimen which was taken in July at Omei-shan.

This species bears a superficial resemblance to *Astictopterus diocles*, Moore, but it is altogether a more slender insect.

Genus PITHAURIA.

Pithauria, Moore, Proc. Zool. Soc. Lond. 1878, p. 689; Watson, *ibid.* 1893, p. 119.

Type, *murdara*, Moore.

Pithauriopsis, Wood-Mason & de Nicéville, Journ. Asiat. Soc. Beng. 1886, p. 387.

Type, *aitchisoni*, W.-M. & de N.

"Fore wing elongated, narrow; apex pointed; exterior margin very oblique; hind margin short; hind wing convex externally, lobular at anal angle. Head and thorax very broad, robust; abdomen not so long as hind wing. Antennæ with a slender club and very long, whip-like tip. Venation similar to *Pamphila*." (*Moore, l. c.*)

Confined to the Oriental region.

Pithauria stramineipennis. (Plate XLI. fig. 19, ♂.)

Pithauria stramineipennis, Wood-Mason & de Nicéville, Journ. Asiat. Soc. Beng. lv. p. 388, pl. xv. fig. 5, ♂ (1887).

Pithauria murdavi ♀, Distant, Rhop. Malay. p. 378 (1886).

"*Male*. Upperside, both wings marked precisely as in *P. murdava*, Moore, but all the setæ on the base of the wings clear white brown, with a touch of yellow on all those in front of the submedian nervure of the fore wing, those on the interno-median area of this wing being concolorous with the white-brown down of the hind wing, the costal area of which is above more or less extensively pale brown. In *P. murdava* the setæ in the hind wing are yellowish olivaceous, all those of the fore wing distinctly yellower; and the costal area of the hind wing is dark. All the spots and streaks of both sides are no less variable in *P. stramineipennis* than they are in *P. murdava*, so we have not attempted to describe them.

"*Female*. Differs from the male in being larger, in the wings being paler, with the scanty setulose clothing at their bases greyish fuscous, paler than the ground in the hind wing, and in the

spots of the fore wing being larger, paler, and more angular; agrees therewith in the costal area of the hind wing being pale brown above.

“Expand, ♂ 1·8–2·0, ♀ 2·1 inches.” (*Wood-Mason, l. c.*)

I have only one example of this species from China. It is a male agreeing very well with Sikkim specimens of the same sex, and was taken by a native collector at Omei-shan.

Messrs. Wood-Mason and de Nicéville in their remarks on *P. stramineipennis* observe:—“We have long known of the existence of two species of the genus *Pithauria* occurring in almost equal profusion in Sikkim and Bhutan, and we recently sent a male specimen of each to Mr. Moore to be named in order that we might know for certain to which the term *murdava* ought properly to be applied. Mr. Moore returned the dark one (which agrees with his figure in the Proc. Zool. Soc. Lond. 1878, pl. xlv. fig. 13) labelled ‘*P. murdava* ♂,’ and the light one, our *P. stramineipennis*, ‘*P. murdava* ♀.’ In describing *P. murdava*, he does not give the sex of the typical specimen, but his description, like his figure, applies best to the dark form. Mr. Distant appears to have fallen into the same error as Mr. Moore, correctly figuring as the male that which we have all along taken as the male of *P. murdava*, but describing the present species as its female. We possess two specimens of the female of *P. murdava*, which differ from the single one of *P. stramineipennis* in having the darker wings richly purple-glossed, with the very scanty setulose clothing of their bases conforming in colour to that of the male, and in the costal area of the hind wing being concolorous with the rest of the organ, as in the male. Expand 2·0 to 2·1 inches.

“In our figure the downy clothing of the upperside of the wings at the base is not represented of a sufficiently light and bright shade; it is in reality of a clear bright whitish brown or straw-colour, which being conspicuously contrasted with the dark margins, renders *P. stramineipennis* most readily distinguishable from *P. murdava*, in which the downy clothing is, as has already been stated, yellowish olivaceous.

“The genital armature, which has been carefully examined in several specimens of each species, though identical in general plan, yet differs greatly in detail in the two.

“Some hundreds of specimens of each species have passed through our hands.”

Distribution. Sikkim, Bhutan, Upper Assam, Cachar, and Western China.

Genus HIDARI.

Hidari, Distant, Rhop. Malay. pp. 392, 395 (1886); Watson, Proc. Zool. Soc. Lond. 1893, p. 123.

- "This genus differs from *Eriomotis* and *Gangara* in having the upper discocellular nervule of the anterior wings longer than the lower; the base of the second median nervule of the anterior wings is also not more than twice as far apart from lower as from upper median nervule." (*Distant, l. c.*)
- "Antennæ long; club robust, elongated, with a long terminal crook. Palpi: second joint very densely scaled, third joint almost entirely concealed. Fore wing: outer margin longer than inner margin; cell less than two thirds the length of costa; discocellulars inwardly oblique: vein 5 from close to bottom of cell; vein 3 well before end of cell; vein 2 almost equidistant from end of cell and base of wing. Hind wing slightly lobate, outer margin even; vein 7 well before end of cell; discocellulars and vein 5 faint; veins 2, 3, and 4 all close together; vein 3 almost equidistant from 2 and 4; vein 2 more than twice as far from base of wing as from end of cell. Hind tibiae with two pairs of spurs, the upper pair short.
- "Type, *irava*, Moore.
- "Confined to the Oriental region." (*Watson, l. c.*)

Hidari grandis. (Plate XXXIX. fig. 13, ♂.)

Plesioneura grandis, Lecch, Entomologist, xxiii. p. 47 (1890).

Male. Fuliginous brown, all the wings paler towards base. Primaries with a greyish apical patch and three subhyaline spots, one in the discoidal cell, a larger one below and a little beyond in the first median interspace, and a smaller one in the interspace above; fringes pale grey, becoming darker towards apex of primaries. Under surface of primaries greyish, costal half suffused with fuliginous from the base to just beyond the subhyaline spots; secondaries fuliginous brown, sprinkled with ochreous scales; fringes as above.

Female. Similar in colour to the male, but without the greyish apical patch on primaries; the subhyaline spots are larger, the two central ones are only separated by the median nerve.

Expanse, ♂ 55 millim., ♀ 68 millim.

Occurs in Western China at Moupin, Wa-shan, Wa-ssu-kow, and Omei-shan, and in Central China at Chang-yang and Ship-y-shan. It is found at elevations up to 5000 feet in June and July.

Genus ISMENE.

Ismene, Swainson, Zool. Ill. vol. i. pl. 16 (1820-21); Watson, Proc. Zool. Soc. Lond. 1893, p. 125. Type, *adipodea*, Swainson.

- "Antennæ: club very robust, about twice as long as shaft, terminal portion tapering to a fine point and curved into a crescent, never bent into a hook. Palpi as already characterized. Fore wing: inner and outer margins subequal; cell slightly more than half the length of costa; vein 12 reaching costa almost opposite end of cell; vein 5 equidistant from 4 and 6; upper discocellular minute, middle and lower discocellulars subequal, almost erect; vein 3

three times as far from base of wing as from end of cell ; vein 2 three times as far from end of cell as from base of wing. Hind wing : cell very short, only reaching about one third across wing ; vein 7 twice as far from 8 as from 6 ; discocellulars very faint, slightly outwardly oblique ; vein 5 well developed ; vein 3 just before end of cell ; outer margin sinuate but not distinctly lobed. Hind tibiae slightly fringed, and with two pairs of spurs. The above diagnosis is from a Javan female of typical *œlipolea*, and applies to the females of all other species of the genus.

- “ In the males of all the species the hind tibiae are much swollen, and have a long tuft of hairs affixed near the proximal end on the upperside, beneath which, along their outer edge, they are clothed with large rounded scales. This character is most fully developed in *mothintha*, and least of all in *harisa*, the other species showing a gradual transition between the two.
- “ In typical *œlipolea* the male has a very prominent rounded patch of appressed scales on the upperside of the fore wing, owing to which the lower margin of the cell is strongly curved upwards, and vein 3 arises near the base of the wing and very close to vein 2. On the hind wing vein 8 is very short, and runs upwards to the costa at a short distance from the base, and, just beyond it, the costal margin is folded over on the upperside. Vein 7 is much as in the female, but vein 6 is strongly curved downwards. The folding over of the costal margin on the upperside gives the wing, as seen from beneath, the appearance of being strongly arched at base and then cut away obliquely to just beyond vein 7.
- “ The above characters occur only in males of typical *œlipolea* from Java and Borneo. In the Indian species, which has hitherto been considered to be identical with *œlipolea* and which I propose to rename *ataphus*, the veins of the fore wing are distorted as in *œlipolea* ; but the costa of the hind wing is not folded over, and the venuration of that wing is much as in the female.
- “ The other species of the genus vary considerably in the male mark of the fore wing, which is sometimes very prominent and sometimes entirely absent, and there is also considerable variation in the distortion of the veins of the fore wing. However, the character of the swollen hind tibiae is invariably present and the females are inseparable, so I have considered it very unadvisable to form new genera on the male characteristics alone.
- “ This genus is confined to the Oriental region, China, and Japan.” (*Watson, l. c.*)

Ismene gomata. (Plate XXXIX. fig. 12, var.)

Ismene gomata, Moore, Proc. Zool. Soc. Lond. 1865, p. 783.

Chaospes gomata, de Nicéville, Journ. Asiat. Soc. Beng. 1883, p. 83, pl. x. fig. 7, ♀.

- “ *Male*. Upperside pale vinaceous brown ; both wings with pale brownish-yellow streaks longitudinally between the veins. Abdomen blackish brown, with yellowish bands. Cilia yellowish. Underside dark brown, with the veins and longitudinal streaks between them greyish green, the brown showing only along each side of the veins ; posterior margin of fore wing broadly pale vinaceous ; exterior margin of both wings defined by a brown line. Third joint of palpi and edge of sides brown, the rest yellow. Thorax, legs, and abdomen beneath orange-yellow.
- “ Expanse 2½ inches. N.E. Bengal.” (*Moore, l. c.*)
- “ *Female*. Upperside very glossy bronzy-green, shading off into glossy indigo-blue at the apex and outer margin. Underside with the markings and ground-colour darker than in Sikkim males ; fore wing with a pale green spot in the second median interspace, with a larger one

in the interspace below it; in the male these spots are merged in a large patch of the pale ochreous ground-colour from the inner margin. The green markings everywhere more restricted and of a darker shade than in the male." (*de Nicéville, l. c.*)

As the Chinese specimens differ from the typical form, I describe them as

Var. **lara**, var. nov. (Plate XXXIX, fig. 12, ♂.) *Male*. Differs from the type of the same sex in having the ground-colour of a darker hue and broader internervular streaks of whitish on the primaries: secondaries have a broad bifurcate whitish streak extending from the base almost to the outer margin, and the abdominal area is broadly whitish, slightly tinged with bluish. On the under surface the veins are broadly bordered with greenish black on primaries and dark green on secondaries. Thorax and abdomen pale greyish brown, the latter banded with blackish and tipped with yellowish.

Female. Agrees on the under surface with Sikkim specimens of the same sex in most characters, but the secondaries are more broadly marked with whitish. The under surface is similar to that of the male of the Chinese form.

Expanse 62-64 millim.

Occurs in Western China at Moupin, Omei-shan, Wa-shan, and Chiau-kou-ho, in June and July.

The female appears much scarcer than the male, as I have only received one example of the former, taken at Omei-shan. Mr. de Nicéville says that he has only seen one Indian example, and Mr. Elwes (Trans. Ent. Soc. Lond. 1888, p. 439) states that the female is unknown to him, and that the species, which is not common in Sikkim, frequents the valleys up to 3000 feet between May and October.

Ismene aquilina.

Ismene aquilina, Speyer, Stett. ent. Zeit. 1879, p. 346.

Ismene jankowskii, Oberthür, Etud. d'Entom. v. p. 23, pl. i. fig. 2 (1880).

Proteides chrysaeglia, Butler, Proc. Zool. Soc. Lond. 1881, p. 856.

Pythauria chrysaeglia, Pryer, Rhop. Nihon. p. 33, pl. x. figs. 5 a, b (1889).

"Alis fasciis, præter limbum late obscurum ferrugineo (♂) seu lutescenti (♀) mixtis, anterioribus maris pone medium supra dilutioribus, subtus pallide maculatis, macula vena transverse nigra: feminae macula media serieque macularum subareuata utrinque pallidis; posterioribus (♂ ♀) subtus unicoloribus umbrinis." (*Speyer, l. c.*)

"Grande, robuste: ♂ en dessus, ailes entièrement brunes avec le bord des ailes largement plus foncé et le reste plus jaune; la tête, le corps tout entier et la base des ailes largement couverts de poils assez longs d'un fauve jaunâtre; les nervures saillantes; l'extrémité de la cellule discoidale noire et au delà une série de petits traits velus, jaunâtres, concentriques, intranervuraux.

"En dessous, d'un brun de bois uniforme mat; le bord inférieur de l'aile supérieure et quelques taches intranervurales carrées situées au milieu de cette aile jaunâtres.

- "La femelle diffère du mâle, parce qu'elle porte à l'aile supérieure une tache jaune pâle assez épaisse dans l'intérieur de la cellule, et au delà, une rangée en forme de croissant de huit taches jaunes intranervurales, dont les premières linéaires allant en s'élargissant jusqu'à la dernière.
- "Le dessous reproduit les différences du dessus." (*Oberthür, l. c.*)
- "Olivaceous brown, the wings with bright golden or yellowish cupreous reflections, and with the basal three fourths densely sprinkled with fulvous hair-like scales; fringe creamy whitish; primaries with an indication of four or five increasing oval discal buff-coloured spots, which, however, are concealed in certain lights by the shot colouring of the wing; head bright fulvous; thorax densely clothed with fulvous hair; palpi jet-black, with a broad yellow band. Under surface olivaceous, with slight golden reflections; primaries with the pale buff spots distinct, forming a pyramidal patch, the base of which is expanded and occupies the whole internal border, divided by the median branches; a small bifid yellow spot within the end of the cell, and a few radiating scales of this colour beyond the cell; secondaries with yellowish abdominal area; tibiae and tarsi bright orange. Expanse of wings 1 inch 10 lines." (*Butler, l. c.*)

This species is not rare in mountainous parts of Central Japan and also in Yesso. It is also found in the Isle of Askold and at Vladivostock. So far it has not been received from either the Corea or China. Flies in July and August.

Ismene septentrionis.

Ismene septentrionis, Felder, Reise Nov., Lep. iii. p. 525, pl. lxxiii. fig. 3 (1867).

Ismene striata, Hewitson, Exot. Butt. iv. (*Ismene*) pl. i. figs. 6, 7 (1867).

- "Ala supra fusca, antice juxta venam costalem et ad basin ochraceo-fulvo squamata et pilosa, dein a plica cellule ultra venam internam nigro paulo elatius squamata, ciliis sordide albidis, postice a basi interiore ultra medium ochraceo-fulvo pilosa, ciliis sordide albidis, in margine anali vero aurantiacis.
- "Ala subtus pallide aneo-virides, venis fuscis lineisque in paribus inter eas fundo multo obscurioribus, antice apud venam subcostalem et medianam ochraceo-fulvo breviter pilosa, vitta lineari inter ramum medianum primum et secundum limboque interno fuscis, postice pilis in costae parte basali arcuata ciliisque analibus aurantiacis.
- "Palpi, articulo terminali nigro excepto, caput et thorax fulvo pilosa. Abdomen nigro-fuscum fulvescenti annulatum, cinctura anali aurantiaco-fulva, vitta ventrali ochraceo-fulva.
- "Ala latiores, quam in mare, supra unicolores, fusca; antice margine tantum costali ad basin ochraceo-fulvo atomato, ceterum omnes utrinque ut in mare. Thorax supra postice canus.
- "Habitat. China Septentrional: Shanghai." (*Felder, l. c.*)
- "Upperside. *Male.* Anterior wing dark brown, with the base and spaces between the subcostal nervules rufous; the median and submedian nervules black at their bases. Posterior wing rufous, with the outer margin dark brown. Underside green, closely striated longitudinally with dark brown. Anterior wing dark brown below the cell; the inner margin rufous, the fringe white. Posterior wing with the fringe orange, broadest at the anal angle; the abdomen below orange, banded with black.
- "Expanse $2\frac{4}{10}$ inches. China." (*Hewitson, l. c.*)

I received one male specimen from Western China. It was taken in July at Moupin.

This species is allied to *I. vasutana*, Moore, from Sikkim, but differs therefrom as follows:—the upper surface is darker, the orange fringes towards anal angle of secondaries are much narrower and paler, and there is an absence of subhyaline spots on disc of both surfaces of the primaries.

Genus HASORA.

Hasora, Moore, Lep. Ceyl. vol. i. p. 159 (1881); Watson, Proc. Zool. Soc. Lond. 1893, p. 127. Type, *badra*, Moore.

Parata, Moore, Lep. Ceyl. vol. i. p. 160 (1881). Type, *chromus*, Moore.

“Antennæ: club thickening rather abruptly and gradually tapering to a fine point, bent beyond the thickest portion, usually at about a right angle, but sometimes almost into a hook; the terminal portion not quite so long as the remainder of the club. Fore wing: inner and outer margins subequal; cell less than two thirds the length of costa; vein 12 reaching costa almost opposite upper angle of cell; vein 5 nearer to 6 than to 4; upper discocellular minute; middle and lower discocellulars inwardly oblique and in the same straight line; vein 3 almost equidistant from base of wing and from end of cell; vein 2 nearer to base of wing than to vein 3; vein 1 distorted downwards near base. Hind wing produced into a lobe; vein 7 slightly nearer to 6 than to 8; discocellulars very faint, outwardly oblique; vein 5 well developed, much nearer to 6 than to 4; vein 3 from just before end of cell; vein 2 almost equidistant from base of wing and from end of cell. Hind tibiae not very densely fringed, and with two pairs of spurs.

“The female differs in vein 3 of the fore wing being three times as far from base of wing as from end of cell.

“The type-species of *Parata* differs from the type-species of *Hasora* in being provided in the male with an oblique discal stigma on the fore wing, and also in some slight differences in the outline of the wings. These two characters, however, exist together only in the type-species of *Parata*, and we find other species with the discal streak of *Parata* and the outline of *Hasora*, or *vice versâ*, while the streak itself appears in every degree of intensity, being sometimes very prominent and at other times barely traceable or altogether absent, the females in all the species being structurally inseparable.

“This genus is represented in the British Museum from throughout India, Malayasia, the Philippines, Fiji, New Guinea, and Australia.” (*Watson, l. c.*)

Hasora chromus. (Plate XXXIX. fig. 7, var.)

Papilio chromus, Cramer, Pap. Exot. iii. pl. cclxxxiv. fig. E (1780).

Goniloba chromus, Moore, Proc. Zool. Soc. Lond. 18 5, p. 777.

Parata chromus, de Nicéville, Journ. Asiat. Soc. Beng. 1885, p. 52.

Hasora chromus, Watson, Proc. Zool. Soc. Lond. 1893, p. 128.

“Male and female dark vinaceous brown.

“Male with suffused blackish subbasal patch: both wings greyish brown basally. Cilia greyish brown. Head and thorax greenish brown. Abdomen brown. Underside with the apex of fore wing suffused with purple-blue; hind wing with a narrow transverse discal bluish-white band, a blackish patch on anal lobe, exterior to which the cilia have a short white line. Third joint of palpi and legs brown; palpi and thorax beneath dull yellow.

“Female paler brown: fore wing with two yellowish semitransparent discal spots and a very small similar spot before the apex.

“Expanse 2 inches.

“Bengal.” (*Moore, l. c.*)

All the examples of this species that I have received from China are females, and, as a rule, they are smaller than Indian specimens. One example from Kwei-chow and another from Omei-shan are without the subapical yellowish spot on primaries and the discal pair are smaller than usual (Plate XXXIX. fig. 7. ♂). An example from Wa-shan is without discal spots and the subapical one is very small: this specimen agrees with *Hasora (Hesperia) ritta*, Butler, as figured by Distaut (Rhop. Malay. pl. xxxv. fig. 4, ♂), but not with Butler's figure (Lep. Exot. pl. lix. fig. 9). The band on under surface of secondaries varies in width, and its external edge is sometimes ill-defined.

Occurs in Western China at Wa-shan, Omei-shan, Ta-chien-lu, and Kwei-chow.

Mr. Elwes*, remarking on this species from Sikkim, refers to it under the name *Hasora alexis*, Fabricius, as follows:—“Not uncommon in the low valleys and up to 5000 feet during the rains. I cannot distinguish between what Moore figures as *alexis* and *chromus*. He says of the Ceylon *alexis*, ‘smaller than *chromus*, with broader and more prominently marked band on the underside of the hind wing.’ I have a large series of specimens, including two males and a female from Ceylon, one pair from Bangalore, four pairs from Sikkim, one male and two females from Andaman Islands, one pair from Shillong, one male from Barrackpur, and two males from

* Trans. Ent. Soc. Lond. 1888, p. 441.

Burmah; but I find too much variation in the size and in the band of the underside to allow me to separate two forms. De Nicéville considers them distinct, and says that *alexis* occurs only in South India and Ceylon. If, however, they are identical, *alexis*, being the older name, should be used; and if they are distinct, the Sikkim form will bear the name of *chromus*."

Distribution. Northern India and Western China.

Hasora anura. (Plate XXXIX. fig. 10, ♀.)

Hasora anura, de Nicéville, Bomb. Nat. Hist. Journ. iv. p. 170, pl. B. figs. 5 ♂, 1 ♀ (1889).

- "*Male.* Upperside, both wings deep bronzy-brown, the base and disc thickly clothed with long ochreous-brown hairs; cilia ochreous brown. Fore wing with a minute subapical transparent shining yellow dot. Underside, both wings dark brown, somewhat glossed with purple. Fore wing with the inner margin broadly pale, a broad discal dark band free from purple gloss. Hind wing with the basal two thirds much darker than the outer third, the dark portion well-defined, bearing towards the abdominal margin on the dividing edge a small prominent ochreous spot, an ochreous anteciliary line from the anal angle to the first median nervule, the ochreous spot and line obscure in one specimen; a prominent whitish spot in the middle of the disc in one specimen, obscure in the other.
- "*Female.* Upperside, both wings coloured as in the male. Fore wing with a quadrate spot at the end of the cell, an elongate one below across the first median interspace, its inner edge straight, its outer edge concave; another smaller narrow spot constricted in the middle across the middle of the second median interspace; three increasing subapical dots—all these spots shining translucent rich ochreous. Underside, fore wing with the spots of the upperside showing through, the inner margin broadly bright ochreous, otherwise as in the male.

"Closely allied to the common *Hasora badra*, Moore, from which it differs in both sexes in having no large anal lobe to the hind wing, this lobe being present in *H. badra* and coloured black on the underside, of which black patch there is no trace in *H. anura*; the latter also is a smaller insect; the female differs in having the three large discal yellow spots of the fore wing considerably smaller, and of a deeper richer yellow.

"Described from two male and four female specimens in Mr. Otto Möller's collection which shew hardly any variation. They have been selected from ninety-three males and forty-five females of *H. badra*, a very common species in Sikkim, in Mr. Möller's collection. The complete absence of the large anal lobe or tail in *H. anura* makes it distinguishable from *H. badra* at a glance. There is also a specimen of this species from Sikkim in the collection of Mr. G. C. Dudgeon, and a male from Shillong in the collection of the

Indian Museum, Calcutta. The latter specimen was submitted for determination to Mr. F. Moore, who pronounced it to be a variety of *H. badra*, but I believe it to be a good species.

"Expanse, ♂ ♀, 2·1 inches. Sikkim, Khasi Hills." (*de Nicéville, l. c.*)

Occurs at Kwei-chow, Omei-shan, Pu-tsu-fong, Moupin, and Chia-kou-ho in Western China; also at Chang-yang and Kiukiang in Central China.

Chinese specimens of this species are larger but do not differ materially from Sikkim specimens in Möller's collection, now in my possession, or from the types as figured by de Nicéville. The subapical spots on primaries of male vary in number from one to three, but in the female there appear to be always three.

Genus RHOPALOCAMPTA.

Rhopalocampta, Wallengren, Rhop. Caffr. p. 17 (1857); Watson, Proc. Zool. Soc. Lond. 1893, p. 129. Type, *forestan*, Cram.

Chaospes, Moore, Lep. Ceyl. vol. i. p. 158 (1881); Distant, Rhop. Malay. p. 372 (1886). Type, *benjamini*, Guérin.

"Anterior wings subtriangular, costal margin arched at base, outer margin obliquely convex, inner margin nearly straight. Costal nerve terminating on costal margin nearly opposite end of cell; fourth and fifth subcostal nervules emitted somewhat close together near end of cell; discocellular nervules almost subequal in length, and obliquely directed inwardly; base of second median nervule about twice as far apart from that of the lower as from that of the upper median nervule. Posterior wings elongate, more or less lobately produced at anal angle. Subcostal nervules bifurcating at about one third before end of cell; first and second median nervules with an apparently common origin at end of cell. Body very robust; palpi broad, flattened, and coarsely pilose, apical joint long, naked and cylindrical; antennae with the apex long, curved, and slender; femora pilose.

"This genus appears to be truly Oriental in distribution; it is allied to *Ismene*, but apart from other structural characters the males have no 'glandular patch of raised scales' on the anterior wings, as is found in species of *Ismene*." (*Distant, l. c.*)

"Antennae: club moderate, about as long as shaft, crescent-shaped, not bent into a hook; very similar to those of *Ismene*, but less robust and with a longer shaft. Fore wing: no discal band in male; inner and outer margins subequal; cell just more than two thirds the length of costa; vein 12 reaching costa before end of cell; vein 5 nearer to 6 than to 4; upper discocellular minute; lower and middle discocellulars almost erect and in the same straight line, the lower the longer; vein 3 three times as far from base of wing as from end of cell. Hind wing produced into a lobe; vein 7 twice as far from 8 as from 6; discocellulars very faint, almost erect; vein 5 wanting; vein 3 from just before end of cell; vein 2 nearer to

base of wing than to end of cell. Hind tibiae with two pairs of spurs, and furnished in the male with a long tuft of hairs attached close to the proximal end, and reaching well beyond the distal end of the tibia.

"This genus is confined almost entirely to Africa and the Malay Archipelago, *benjamini* alone being found in India, China, and Japan, while the range of *anchises* extends to Aden." (*Watson, l. c.*)

Rhopalocampta benjamini.

Thymele benjamini, Guérin, Deless. Souv. Voy. Inde, ii. p. 79, pl. xxii. figs. 2, 2 a (1843).

Chasmodon benjamini, Moore, Lep. Ceyl. p. 159, pl. lxiv. figs. 1 a, b (1881).

Ismene benjamini, Pryer, Rhop. Nihon. p. 33, pl. x. fig. 4 (1889).

Ismene benjamini, var. *japonica*, Murray, Ent. Mo. Mag. xii. p. 4 (1875).

Hesperia canthopogon, Kollar, Hüg. Kaschm. iv. p. 453, pl. xviii. figs. 1, 2 (1848).

"Male. Upperside glossy bluish-purple olive-brown, the basal area more distinctly olive-brown. Cilia of hind wing and anal lobe broadly ochreous red.

"Female deeper olive-brown. Underside glossy, aenescant olive-brown, the veins black: fore wing with a broad paler cupreous-brown band on posterior margin: hind wing with a broad ochreous-red lobular patch with black macular upper border and broad central angular streak. Thorax greyish olive above, vertex bluish olive, abdomen brown; palpi and thorax in front, and abdomen beneath, ochreous-red.

"Expanse 2 to 2½ inches.

"Larva with broad transverse dorsal black and yellow bands and two rows of white spots along the back; head, two anal segments, and laterally below the bands red; face black-spotted.

"Pupa pinkish grey, black-spotted." (*Moore, l. c.*)

The food-plant is not given, but according to Wade, as quoted by Moore, "the larva rolls itself up in the tip of the leaf on which it feeds, and when it has eaten this leaf it goes to another, and so on till it changes to pupa."

Var. *japonica*, Murray. "Differs from Indian examples in wanting the dark shade which suffuses all the outer portions of the fore wings in typical examples." (*Murray, l. c.*)

The specimens from Japan are paler and brighter than those from India. Both forms occur in China, together with examples intermediate between the two.

I met with the species in the Island of Kiushiu, Southern Japan. It frequented the sweet-scented white blossoms of a shrub, the name of which is unknown to me; but, owing to its swift and erratic flight, it was difficult to secure in good condition. Pryer says that it occurs at Oyama, Nikko, and

Yamato in Central Japan. In China it occurs at Moupin, Omei-shan, Ichang, Chang-yang, and I have a specimen captured by myself at Ningpo in April.

Distribution. Ceylon, India, Himalayas, Cachar, China, Siam, and Japan.

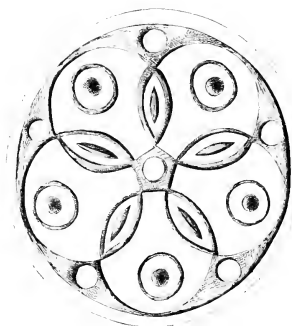
Rhopalocampta translucida, sp. nov. (Plate XXXIX. fig. 11, ♂.)

Male. Primaries fuliginous, with hyaline patches in the median interspaces and outer portion of discoidal cell; there are also some short hyaline streaks beyond the extremity of the cell; the first median nervule and submedian nervure are broadly blackish, and between them is a blackish nerve-like streak, the interspaces are powdered with bluish grey, and there are some scales of the same colour on the middle of inner margin. Secondaries have the discal area hyaline, intersected by the blackish venation and some black nerve-like streaks; the outer margin is broadly fuliginous and there are some fuliginous hairs on the median and submedian nervures; the abdominal fold is grey, margined with long fuliginous hairs. Under-surface same as above, but more or less suffused with blackish. Head and palpi orange, the latter tipped with brownish. Thorax and body fuliginous, the former with long hairs projecting from it over the body, and the latter has the segments edged with greyish.

Expanse 68 millim.

One male specimen taken at Omei-shan, Western China, in July.

I have placed this species in *Rhopalocampta* provisionally only, as it does not agree exactly in all characters with that genus, especially as regards the palpi.



AINU BUCKLE OF WOOD. (Island of Yesso.)

APPENDIX.

OF the following species the majority are new and were only described whilst this work was passing through the press; the others were omitted because I was not then certain that the localities from which they were recorded properly belonged to the region here dealt with.

Caduga tytia.

Caduga nipponica, Moore, Proc. Zool. Soc. Lond. 1883, p. 249.

Caduga tytia (ante, p. 1).

.. Differs from typical *C. tytia* in its larger size: fore wing very black, with broader subapical streaks: comparatively smaller and more ovate upper discal spots; the lower discal outer spot also smaller, the latter being more transversely narrow and less quadrate in shape: the submarginal row of spots larger, and the marginal row more distinct; hind wing in male with all the veins and their borders blackish, the spatular glandular patch and streaks therefrom very black: no red bifid streak within the cell, which is replaced by a very indistinct slender grey line: the marginal spots are more or less obsolete.

.. Expanse, ♂ 4 $\frac{1}{4}$, ♀ 3 $\frac{1}{4}$ inches.

.. *Hab.* Nikko, Japan.

.. A specimen of a female in my own collection from North Formosa agrees very nearly with the specimens from Japan. Mr. W. B. Pryer collected specimens of what may probably be this species in Chekiang, N. China." (*Moore, l. c.*)

This form is hardly worthy of a varietal name and is not constant.

Lethe cybele, sp. nov. (Plate XLIII. fig. 8.)

Male. Obscure reddish brown, rather silky. Primaries fuliginous at base and along costa, outer margin with a blackish border. Secondaries are broadly bordered with blackish, the inner edge of the border is ill-defined and irregular: marginal line pale, double, not well-defined

towards costa; there is a blackish spot between the subcostal and discoidal nervules, and a smaller one between the second and third median nervules. Under surface: primaries pale olivaceous brown, clouded with yellowish on the discal area; a pale yellowish band traverses the wing from about the middle of the costa to inner angle, and is broken up into spots in the median and submedian interspaces; there is a white-pupilled subapical ocellus, with a bluish dash on costa above it and a white spot in interspace below it; marginal line bluish white, edged internally with blackish and interrupted by the nervules; secondaries dark olivaceous brown, the basal two thirds traversed by several wavy shining violet-grey lines; the outer edge of the basal portion of the wing is indented and edged with yellowish, most conspicuously in the median interspace; there is a series of six ocelli preceded by a shining violet-grey wavy line, all the ocelli are pupilled with violet-grey, but, excepting those of the third and fourth, the pupils are minute; the first ocellus is followed by a patch of violet-grey, and there is a tinge of the same colour beyond the second and third ocelli; marginal line follows the contour of the wings and is violet-grey, narrow towards costa, and broader towards anal angle.

Expanse 55 millim.

One example, taken at Omei-shan in June at an elevation of about 3500 feet.

This species is allied to *L. violaceopicta*, but differs in being rounder in the wing and redder in colour; on under surface of primaries the macular band is more conspicuous.

Lethe sicelides.

Lethe sicelides, Grose Smith, Ann. & Mag. Nat. Hist. (6) xi. p. 218 (1893).

“*Male*. Upperside brown. Anterior wings with a broad darker brown indistinct band on the outer margin, and a large triangular indistinct sericeous patch, having its base on the inner margin and towards its apex extending beyond the end of the cell. Posterior wings without any tufts of hair within the cell; a submarginal row of four dark brown spots without any white centre, and surrounded by pale brown rings, the spot nearest the apex and the next but one being the largest.

“*Underside*: anterior wings with the cell crossed in the middle by two dark bars, the inner bar thicker than the outer and the space between being pale; a dark line at the end of the cell; two indistinct spots underneath each other towards the apex, with white centres and surrounded by pale rings; the other markings on the anterior and those on the posterior wings very nearly the same as on *L. sicelis*, Hewitson, but on the posterior wings the spot (in the submarginal row of spots) between the middle and lowest median nervules is much smaller than in *L. sicelis*, and the outer of the two narrow bands which cross the wings is bifid at its lower end and further apart from the inner band.

“Expanse of wings 2½ inches.

“Three specimens: Omei-shan, Western China.

“Very like *L. sicelis* in general appearance, but belonging to a different

section of the genus. The large sericeous patch on the anterior wings and the absence of the tufts on the posterior wings distinguish it from that species." (*Grose Smith, l. c.*)

This species will be figured in a future part of 'Exotic Butterflies' by Grose Smith and Kirby.

Ypthima elwesi, sp. nov. (Plate XLIII, fig. 7, ♂.)

Male. Fuliginous. Secondaries have a small subanal ocellus. Fringes dark grey. Under surface dark brown striated with pale brown, especially on the secondaries; there is a bipupillated ocellus towards apex of primaries and three ocelli on secondaries. Expanse 58 millim.

One male example from Omei-shan.

I am indebted to Mr. Grose Smith for this specimen, which was taken by a native collector.

Ypthima pratti. (Plate XLIII, fig. 9, ♂.)

Ypthima pratti, Elwes & Edwards, Trans. Ent. Soc. Lond. 1893, p. 35.

"*Male.* Upperside brown: fore wing with a wide dark marginal band; the pale irrorate ocellar space subtriangular, reaching from the costa to the inner margin, its inner edge straight, oblique; sex-mark wanting; ocellus large, well-defined, bipupilled; hind wing with a wide dark marginal band, separated from the actual margin by a pale line, the pale irrorate ocellar space broad and band-like, its inner edge irregular; a large unipupillate ocellus in the first median interspace, a minute one just below it, and another small one faintly indicated in the second subcostal interspace. Ground-colour of the underside whitish grey; fore wing with the inner edge of ocellar space bounded by an oblique, elongate-triangular brown band, widest on the inner margin; outer edge of the ocellar space bounded in the lower half by a brown curved line, which starts from the posterior angle and becomes evanescent about the middle of the hind margin; from the base of the wing to the oblique band the striolation is closer; hind wing with the striolation moderately close and rather irregular, with a faint trace of an irregular median yellow-brown band coincident with the inner edge of the ocellar space on the upperside; ocelli 4, 2 subapical and 2 subanal, the anal one bipupilled.

"Expanse 46 millim." (*Elwes & Edwards, l. c.*)

In their remarks on this species Elwes and Edwards observe:—"A specimen from Ichang in Mr. Leech's collection is very puzzling, and judging from the clasp alone, which we have figured under the name of *prattii*, pl. iii. fig. 55, would be a distinct species. It has most resemblance to *argus*, but the upper ocellus of the middle pair is absent, though on the proper right side there are some scales, which makes us think that the specimen is an abnormal

one in which the spot is absent. If, however, others should be found in China showing that this is a normal specimen, we should be unable to treat it as a variety of any known species. On the upperside it differs from any specimen of *argus* that we have yet seen in that, being a male, it has on all the wings a dark marginal band of which the inner edge is sharply defined and the ocellar space sharply defined on both wings."

I now find that I have another example from Ichang, which must be the female of this species. It agrees perfectly in the colour of upper surface, but, in addition to the ocelli on upper surface of secondaries shown in figure of the type, this specimen has two others, one in second median interspace and one near costa. On the under surface the colour and striation agree exactly, the ocelli are the same in number and similarly placed, but are slightly larger, and the subanal pair are in contact.

Ypthima chinensis. (Plate X. fig. 5, ♂.)

Ypthima newara, var. *chinensis*, Lecch (ante, p. 89).

Ypthima chinensis, Elwes & Edwards, Trans. Ent. Soc. Lond. 1893, p. 21.

"Somewhat larger than *newara*, M., from which it may be distinguished on the upperside by the paler colour of the outer area of both wings in the male. The underside is whitish grey, without any markings beyond the ordinary striolation, which exhibits a tendency to coalesce and form a brown cloud about the inner margin of the fore wing. The constancy of the form of the clasps has been tested in four cases.

"Hab. Kiukiang and Chang-yang, Central China." (*Elwes & Edwards, l. c.*)

I was disposed to consider *chinensis* a form of *Y. newara*, Moore, but Elwes and Edwards have ascertained that the form of the clasp in *chinensis* is different to that of *newara* and have consequently elevated the former into a species.

Ypthima motschulskyi (*ante*, p. 88).

Ypthima motschulskyi, Bremer & Grey, Schmett. N. China's, p. 8, pl. ii. fig. 2 (1853);

Elwes & Edwards, Trans. Ent. Soc. Lond. 1893, p. 16.

Ypthima amphithea, Ménétré; Staudinger, Rom. sur Lép. vi. p. 203; Elwes & Edwards, l. c.

"Alis supra: nigro-fuscis, ocelli unico caeruleo-pupillato, flavo annulato; subtus: cinereis, fuscundulatis et nebulosis; anticis ocello unico; posticis tribus, omnibus caeruleo-pupillatis et flavo-annulatis.

"Expans. alar. antic. unc. 1½." (*Brem. & Grey, l. c.*)

In dealing with *Y. motschulskyi*, Elwes and Edwards write—"The insect which we have taken to represent this name agrees in every respect with the figure of Ménétrics above cited, except that the latter does not show the velutinous patch on the disk of the fore wing. It would be a mere waste of time to attempt to trace the full synonymy of this species, as we can only separate it with certainty from its allies by the form of the clasp; but we have treated *amphithea*, Mén., as a synonym in deference to Staudinger's opinion as expressed in Rom. Mém. vi. p. 203. *Hab.* Nagasaki, Japan; Fusan, Korea (*Lecch*); Kiukiang (*Pratt*); Shanghai (*Pryer*)."

Staudinger records *Y. motschulskyi* from Amurland and expresses his opinion that *urelda*, Kollar, from Northern India, is a local form of that species.

Ypthima perfecta. (Plate X. fig. 7, ♂.)

Ypthima motschulskyi, var. *perfecta*, *Lecch* (ante, p. 88).

Ypthima perfecta, Elwes & Edwards, Trans. Ent. Soc. Lond. 1893, p. 19.

This insect, which I described and figured as a form of *Y. motschulskyi*, is now considered by Elwes and Edwards a distinct species. They write of it:—"This is distinguished from its allies by the well-defined straight-sided ocellar space on the underside of the fore wing, which is open both to the costa and the inner margin, and the irregular pale band on the underside of the hind wing, but most certainly by the different form of the clasp."

This species is common in Western and Central China. It varies considerably in size and number of ocelli. In typical examples there is only one ocellus on each wing, in some specimens there is a small ocellus beneath or adjoining that at apex of primaries, and the number of ocelli on secondaries ranges from one (in the type) to four on the under surface; the usual number is one on the primaries and three on the secondaries, but they may be increased to two on the primaries and four on the secondaries.

Ypthima obscura.

Ypthima obscura, Elwes & Edwards, Trans. Ent. Soc. Lond. 1893, p. 17.

"*Male.* Upperside fuliginous brown, with pale grey fringes; ocellus of the fore wing barely indicated; one well-defined subanal ocellus on the hind wing, the dark velutinous patch on the fore wing indistinct. Underside greyish white, the striolation moderately close and fine, the latter on the distal half of the fore wing coalescing to form a brown cloud arising in the

posterior angle and limiting the subcircular ocellar space; striolation of the hind wing closer in the basal two thirds, and coalescing to form a submarginal band, which widens irregularly inwards between the subapical ocellus and the one below it; ocelli 3, as in *Y. mitschulskyi*, &c.

“*Female*. Upperside somewhat paler than the male; the ocellus of the fore wing large and well-defined. Underside similar to the male, but the only brown markings beyond the striolation are the faint brown bands which limit the subtriangular ocellar space.

“*Expanse*, ♂ 45 millim., ♀ 44 millim.

“This species may always be recognized by the peculiar shape of the apex of the clasp. Gensan, Corea, July 1886 (*Leech*). Type in coll. Elwes.” (*Elwes & Edwards, l. c.*)

I met with this species fairly commonly in the neighbourhood of Gensan, Corea, in June and July 1886. This is the only record of its capture hitherto, but the specimens taken by Wulffius at Possiet Bay and by Herz in Corea may not improbably prove to be this species on dissection.

In one of my Gensan male specimens the ocellus towards anal angle on upper surface of secondaries is very minute, and in another entirely absent. The ground-colour of under surface also varies in tint.

Ypthima sordida.

Ypthima sordida, Elwes & Edwards, Trans. Ent. Soc. Lond. 1893, p. 19.

“*Male*. Upperside brown: fore wing with an ill defined dark velutinous shade on the disk coincident with the sex-mark, and a well-defined bipupilled subapical ocellus; hind wing with a well-defined unipupillate ocellus in the first median interspace. Underside whitish grey: fore wing with the striolation very close, and in parts coalescent, so that the surface has a brown appearance; ocellus as on the upperside, ocellar space absolutely undefined; hind wing with the striolation somewhat irregular, coarser, and sparser, so that the surface has a somewhat hoary appearance; ocelli three, one subapical, as large as that on the fore wing, one about half as large in the first median interspace, and a bipupilled one of similar size to the last near anal angle.

“*Expanse* 46 millim.

“*Hab.* Kiukiang, June 1887 (*Pratt*). Described from a single example in coll. Elwes.” (*Elwes & Edwards, l. c.*)

Closely allied to *Y. obscura*, from which it may be distinguished by its narrower primaries and white fringes. The ocelli are larger than in the male of that species, but agree almost exactly with those of the female. On the under surface the ground-colour is less heavily striated about the disc and outer portion of primaries; the ocelli seem to agree perfectly with those of male *Y. obscura*.

Ypthima multistriata.

Ypthima multistriata, Butler, Ann. & Mag. Nat. Hist. (5) xii. p. 50 (1883); Elwes & Edwards, Trans. Ent. Soc. Lond. 1893, p. 18.

"Allied to *Y. nareda* and *Y. corticaria*, intermediate in size between the two. Wings above smoky brown, paler on the disc of the wings, especially in the female, and with blackish submarginal and marginal stripes: primaries of the female with a large oval bipupillated ocellus towards the apex, the male rarely showing a trace of a similar ocellus, but usually entirely destitute of it: secondaries with a large circular unipupillated ocellus on the first median interspace and frequently, in the male, one or two minute subanal ocelli in an oblique line with the large ocellus: primaries of the male with a blackish nebula over the median area. Under surface sordid white, the primaries and base of secondaries more or less suffused with brown, and the entire surface of all the wings densely covered with numerous sharply-defined darker brown striae; marginal and submarginal stripes as above: primaries in both sexes with a well-defined bipupillated black subapical ocellus with yellow iris: a dark brown stripe from just beyond the middle of the costa across the disc to the termination of the submarginal stripe: secondaries crossed beyond the middle by an irregularly angulated stripe, sometimes barely traceable, but usually well defined; three well-defined ocelli, one apical and two subanal, the last being smaller than the others and bipupillated.

"Expansion of wings 37-42 millim.

"Seven examples, N. Formosa." (*Butler, l. c.*)

Elwes and Edwards have identified a specimen taken at Ichang by Pratt as this species, which differs chiefly from *Y. motschulskyi* in the absence of ocelli from the upper surface of primaries and in the form of the clasp.

Ypthima argus.

Ypthima philomela, Lecch (ante, p. 90).

Ypthima argus, Butler; Elwes & Edwards, Trans. Ent. Soc. Lond. 1893, p. 35.

In placing *Ypthima baldus*, Fabricius and Hewitson, as a synonym of *Y. philomela*, Johanssen, I followed Kirby and de Nicéville. Elwes and Edwards, however, are of opinion that the name *philomela* should be dropped, as it is impossible to precisely determine what insect was intended. Hewitson's description applies in every way, except as regards the presence of a sex-mark, to the species which these authors now call *Y. marshalli*, Butler, and of which Mr. Elwes has specimens taken by myself at Foochow. They also consider *evanescens*, Butler, from Japan, to be a form of *Y. marshalli*, but only give the following localities for the species:—Bhotan, Khasias, Assam, Bombay, Bengal, Akyab, Mysore, Nilgiris, Perak, Foochow.

Ypthima argus, Butler, is stated by Elwes and Edwards to be peculiar to Northern Asia and Japan; and Staudinger, who refers to it as *laldus*, is of opinion that Japanese examples can be separated from mainland specimens by their lighter under surface. I only found this to be the case in the Island of Yesso, and it is not constant even there. However, *Y. argus* may generally be distinguished by its larger size and narrower wings. In two examples there is only one ocellus on secondaries.

***Epinephele deiphobe*, sp. nov.** (Plate XLIII. fig. 10.)

Male. Dark brown. Primaries have two large velvety black spots, centred with white and surrounded with fulvous: the space between these ocelli is suffused with fulvous; male brand as in *E. cheena*, Moore. Secondaries have a small black spot ringed with fulvous in first median interspace; fringes greyish, marked with darker at the extremities of the nervules. Under surface: primaries fulvous; costa, apex, and outer marginal border greyish, the latter limited inwardly by a blackish rather sinuous line; beyond the middle of the wing is a brown transverse line, acutely angled in second median interspace; the space between these two lines is rather paler fulvous and encloses two black spots as above, but the subapical one encloses two white dots; secondaries grey, mottled and streaked with darker; the central area of the wing is traversed by a wavy line; there are four black spots encircled with greyish brown, two subapical and two subanal.

Expanse 50 millim.

Closely allied to *E. cheena*, Moore (Proc. Zool. Soc. Lond. 1865, p. 501, pl. xxx. fig. 6).

One male specimen, taken by a native collector on the high plateau to the north of Ta-chien-lu.

***Cœonympha pavonia*.**

Cœonympha pavonia, Alphéraky, Stett. ent. Zeit. xlix. p. 66 (1888); Rom. sur Léop. v. p. 119, pl. v. fig. 8 (1889).

"Alæ dilute fulvæ, anticæ ad apicem orbiculo magno cæco (inter venas 5 et 6) punctuloque parvo (inter venas 2 et 3) fuscis; posticæ serie antemarginali orbiculorum caecorum fuscorum.

"Subtus alæ dilute fulvæ, posticarum pagina interna dense griseo atomata extus (irregulariter) albido limitata, orbiculis omnibus (ut supra sitis) albo pupillatis, striga argentea submarginali per omnes continuata; ciliis albidis grisescente interruptis. ♂ = 30 mill." (*Alphéraky, Stett. ent. Zeit.*)

This species occurs in July near the Heï-ho river, in the province of Kan-sou.

Cœnonympha sinica.

Cœnonympha sinica, Alphéraky, Stett. ent. Zeit. xlix. p. 66 (1888); Rom. sur Léop. v. p. 121, pl. v. fig. 7 (1889).

"*Cœn.* var. *philoxeno*, Esp., affinis, differt statura majori (præcipue ♀) strigaeque antemarginali alarum omnium subtus argentea. ♂ ♀ = 34-41 mill." (*Alphéraky, Stett. ent. Zeit.*)

Alphéraky states that the markings of this species agree with those of *C. typhon*, Rott., var. *philoxenus*, Esp., but are more distinct. The undulated silvery submarginal band on the under surface of all the wings will, however, serve to separate *C. sinica* from any form of *C. typhon*.

This species was met with in June at the foot of the Nian-shan mountains, in the province of Kan-sou, and in July near the town of Tchün-ta-sy.

Callerebia bocki.

Callerebia bocki, Oberthür, Etud. d'Entom. xviii. p. 17, pl. vi. figs. 80, 80 a (1893).

- " Nous avons reçu cinq ♂ très frais du Su-Tchuen occidental (Vench'uan et Traku); ils nous ont été transmis par M. Carl Bock qui les tenait de ses chasseurs indigènes.
- " Le dessus est brun noir, à peu près comme *hebs*, Stgr., du Turkestan. Le disque porte une tache divisée en quatre parties par les nervures, d'aspect velouté plus noir que le fond (il faut cependant présenter le Papillon de côté pour bien la voir). Les ailes sont bordées d'un seul rang de points violâtres intranervuraux, encadrés de noir plus foncé que le fond des ailes.
- " En dessous, les premières ailes sont d'un rouge ocracé, avec la côte grisâtre, l'apex et le bord terminal teints d'abord de grisâtre, puis de brunâtre; une ligne sinuuse noirâtre parallèle au bord terminal; quatre taches intranervurales blanc violâtre, les deux supérieures plus largement encadrées de noir que les deux autres; enfin une ligne rouge foncé descendant du bord costal vers le bord interne, entre la cellule discoidale et les quatre taches blanc violâtre encadré de noir, précitées.
- " Les ailes inférieures sont gris foncé traversées au-delà du milieu par une ligne sinuuse brune extérieurement éclairée de gris jaunâtre. De plus, on voit une rangée de points blancs intranervuraux et une série de croissants bruns formant une ligne régulièrement sinuée entre les points blancs précités et le bord terminal qu'elles suivent tout-à-fait parallèlement.
- " Les antennes, le corps et les pattes sont noirs en dessus et gris en dessous." (*Oberthür, l. c.*)

Somewhat resembles *C. albipuncta*, Leech (*ante*, p. 102), on the under surface.

Callerebia carola.

Callerebia carola, Oberthür, Etud. d'Entom. xviii. p. 18, pl. vi. figs. 79, 79 a ♂ (1893).

- " Nous possédons beaucoup d'exemplaires des deux sexes, recueillis par les chasseurs indigènes de M. Carl Bock à Vench'uan et Traku (Su-Tchuen occidental).
- " Les ailes du ♂ sont en dessus d'un brun assez uniforme, mais un peu plus foncé sur le milieu que sur les bords, avec quatre points violâtres aux supérieures et deux aux inférieures. Ces

points violâtres sont entourés de noir. Aux supérieures les deux points les plus rapprochés de l'apex sont compris dans le même entourage noir; les autres points ont chacun leur cercle noir séparé. De plus, aux ailes supérieures, une tache fauve rouge, affectant une forme générale presque triangulaire, ayant sa base près du bord costal et sa pointe vers l'angle interne, entoure les points violâtres, cerclés de noir.

- “Aux ailes inférieures, un cercle fauve rouge entoure le cercle noir.
- “En dessous, les points violâtres du dessus sont reproduits avec la même entourage noir, mais aux supérieures seulement, sur un fond rouge ocreux; la côte est brune, ainsi que l'apex et le bord terminal; mais un semis épais d'atomes gris s'étend, sur l'apex et la partie du bord terminal qui en est voisine.
- “Les inférieures sont brunes, saupoudrées d'un semis épais d'atomes gris, qui donne à la surface des ailes un aspect général grisâtre, avec des ombres assez obscures, surtout près du bord antérieur et près du bord terminal. Une ligne de points blancs intranervuraux est parallèle au bord terminal.
- “Les franges sont brunes et grisâtres. En dessus le corps est brun foncé en dessous brun grisâtre.
- “La ♀ diffère du ♂ par l'extension des cercles noirs qui entourent les points violâtres aux supérieures, un lavis rougeâtre sur l'espace cellulaire des supérieures, un supplément de points violâtres intranervuraux aux inférieures, en remontant vers le bord antérieur.
- “En dessous, la surface des ailes inférieures a un aspect plus jaunâtre et un éclaircie sinieuse, plus accentuée que chez le ♂, descend du bord anal.
- “L'espèce paraît peu varier. Cependant chez certains ♂, les taches violâtres sont aux ailes inférieures, comme chez la ♀, au nombre de trois ou quatre, allant en se rapetissant vers le bord antérieur.” (*Oberthür, l. c.*)

This is a good species, and seems to come between *C. sylvicola*, Oberth., and *C. pratorum*, Oberth.; it has some of the more important characters of each of these species.

Melanitis leda (*ante*, p. 106).

I find on further examination that the specimens figured as var. *ismene* (Plate XIII. figs. 2 & 5) are not typical; Mr. Moore refers them to his *M. lela*. Under whatever name this insect may stand, however, I have little doubt that it represents a seasonal form of *M. leda* in the district under consideration. The specimens are fairly constant in the Chinese localities from which they came, and in most of those places typical *M. leda* has also been found.

Calinaga lhatso.

Calinaga lhatso, Oberthür, Etud. d'Entom. xviii. p. 13, pl. vi. fig. 81 (Nov. 1893).

- “Comme les *Parvassius*, dont toutes les espèces présentent une disposition générale des taches tout-à-fait analogue, les *Calinaga* offrent tous le même dessin.

"*Lhaso* diffère de tous les autres par la teinte jaunâtre de ses taches en dessus, le lavis orangé qui s'étend sur l'angle anal, la couleur jaune ocracée qui fait le fond des ailes inférieures et de l'apex des supérieures en dessous.

"De plus, les ailes sont plus opaques, les parties noires plus accentuées, et la forme des ailes moins arrondie que dans *dauidis*; elle est cependant moins anguleuse que chez *buddha*.

"Tsé-kou (Tibet), R. P. Dubernard." (*Oberthür, l. c.*)

This appears to be a very distinct species. M. Oberthür (*l. c.*) also records *C. buddha* from the same locality, but I am inclined to think that this is an aberrant form of *C. dauidis*, a species he previously confounded with *C. buddha*.

Dichorragia nesseus.

Dichorragia nesseus, Grose Smith, Ann. & Mag. Nat. Hist. (6) xi. p. 217 (1893).

"*Male*. Upperside dark bluish green. Anterior wings with the cell crossed by three black bars, that nearest the base nearly obsolete; beyond the cell, across the disk between the veins, is a curved row of indistinct greyish spots, the second and third of which are elongate; a submarginal row of sagittate grey markings, elongated inwardly to the extent of about one third of the wings, those towards the apex being more elongate and narrower than the others; there are no spots on the outer margin. Posterior wings more bluish green than the anterior wings and without grey markings, except three small hastate lines near the apex, with grey lines at their base, the lowest almost obsolete; beneath these, on the outer margin between the veins, is a series of black hastate spots.

"Underside: anterior wings bluish black, with the spots beyond the cell more distinct and the bars crossing the cell and a small spot beyond violaceous; the sagittate markings as on the upperside, but more distinct. Posterior wings olivaceous, the hastate spots at the apex as on the upperside, and the series of marginal black spots faintly and very narrowly bordered with white.

"Expanse of wings $2\frac{3}{8}$ inches.

"One example. Omei-shan, Western China.

"Near to *D. nesimachus*, Boisduval, but considerably less maculate." (*Grose Smith, l. c.*)

A figure of this species will be given in a future part of 'Exotic Butterflies,' by Grose Smith and Kirby.

Euthalia strephon.

Euthalia strephon, Grose Smith, Ann. & Mag. Nat. Hist. (6) xi. p. 216 (1893).

"Upperside olivaceous green. Anterior wings crossed beyond the middle from the costal to the submedian nervures by a pale greenish-yellow band, widest on the costa, narrowest between the two upper median nervules; a small yellowish somewhat elongate spot near the costal margin, and a larger oval spot of same colour at the outer edge of the band beneath it; the space between and on each side of the dark bars which cross the cell is also pale greenish yellow. Posterior wings with a pale greenish-yellow curved band following the contour of

the outer margin from the middle of the costa, gradually narrowing and becoming obsolete towards the lowest median nervule; an oval dark ring crossing the cell and an indistinct submarginal row of dark green hastate spots.

“ Underside olivaceous yellow. On the anterior wings the yellowish-green band is more clearly defined and edged on each side with black, narrowly towards the costa, gradually and irregularly becoming broader towards the submedian nervure, where it ceases. Posterior wings with the pale greenish-yellow curved band as above, bordered on each side with olivaceous green, the space round the spots in the cell and on the outer margin being the same colour as the central band.

“ Expanse of wings $2\frac{1}{2}$ inches.

“ Nearest to *E. omeia*, Leech, which it resembles in colour, but the posterior wings are very different.

“ Five specimens were sent, apparently all males. Omei-shan, Western China.” (*Grose Smith, l. c.*)

This species will be figured in a future part of ‘Exotic Butterflies’ by Grose Smith and Kirby.

Euthalia irrubescens.

Euthalia irrubescens, Grose Smith, Ann. & Mag. Nat. Hist. (6) xi. p. 216 (1893).

“ *Male*. Upperside: anterior wings with the basal half dark green, almost black, the outer half paler and slightly metallic, the veins, with streaks between them on the paler portion of the wings, being the same colour as the basal half; the cell is crossed in the middle by an irregular crimson bar, and there is another crimson bar, narrower and somewhat indistinct, at the end of the cell. Posterior wings the same colour as the basal half of the anterior wings, being paler across the disk and traversed by the dark veins with streaks between, as on the outer half of the anterior wings; two dark bars across the cell, and there is a crimson elongate spot parallel with the outer margin between the submedian nervure and the lowest median nervule; the costal margin is pale and tinged with a bluish shade.

“ Underside similar to the upperside, but paler. Anterior wings with the crimson bars across and at the end of the cell wider and more distinct, and a small black spot below the median nervure at its junction with the lowest median nervule. Posterior wings with two crimson bars crossing the cell, two crimson spots below the costal nervure and upper median nervule respectively, another crimson spot on the costal margin near the precostal nervure, and another at the base: on the outer margin at the ends of the dark streaks between the veins is a row of crimson spots, those nearest the anal angle the most distinct, and those in the middle nearly obsolete; the inner margin from the base to the anal angle is broadly edged with crimson. Antennæ black, the collar and palpi crimson.

“ Expanse of wings $2\frac{1}{2}$ inches.

“ One specimen only. Omei-shan, Western China.

“ Allied to *E. lubentina*, Cramer, var. *ludonia*, Standinger, and *whiteheadi*, Grose Smith.” (*Grose Smith, l. c.*)

Grose Smith and Kirby will figure this species in a future part of ‘Exotic Butterflies.’

Euripus funebris (*ante*, p. 150).

The female of this species differs from the male in being larger, and in having a broader crimson dash in the discoidal cell.

Expansion 140 millim.

One example, from Omci-shan, in the collection of Mr. Grose Smith.

Limenitis albomaculata.

Limenitis albomaculata, Leech, Entomologist, xxiv., Suppl. p. 28, ♂ (Feb. 1891); *ante*, p. 178; Oberthür, Etud. d'Entom. xvi. p. 7, pl. ii. fig. 15 (1892); *op. cit.* xviii. p. 15, pl. vi. fig. 82, ♀ (1893).

“La ♀ de *Limenitis albomaculata* diffère beaucoup du ♂ par le dessus des ailes. Celles-ci sont brunes. Les supérieures ont un gris trait cellulaire jaunâtre, une bande maculaire jaunâtre, extracellulaire, décrivant du bord costal au bord interne un arc un peu irrégulier de forme et de continuité, enfin une tache apicale divisée en trois parties par les nervures de la même couleur jaunâtre un peu fauve.

“Les ailes inférieures sont traversées par une bande également jaunâtre, légèrement courbe, naissant au bord costal et descendant jusque près du bord anal. De plus, les deux ailes sont bordées d'une double ligne brun pâle qui suit parallèlement le contour extérieur des ailes.

“Le dessous, surtout aux inférieures, rappelle beaucoup plus le ♂. Les taches et bandes jaunâtres qu'on remarque sur les ailes en dessus, sont reproduites exactement en dessous, mais en blanc, sauf la tache longue cellulaire qui reste jaunâtre.

“Nous possédons deux ♀ seulement. Le ♂ paraît commun dans la région comprise entre Tâ-Tsien-Lou et Mou-Pin.” (*Oberthür, l. c.*, 1893.)

The insect which M. Oberthür has figured and described as the female of *Limenitis albomaculata* is very different in appearance to the male of this species; in fact, the only characters at all identical are those on the basal two thirds of secondaries on under surface and the transverse marks crossing the discoidal area.

Limenitis cleophas.

Limenitis cleophas, Oberthür, Etud. d'Entom. xviii. p. 16, pl. vi. fig. 83 (1893).

“En dessus, *cleophas* ressemble à *recurva*, Leech (Butterflies from China, pl. xvii. fig. 9); c'est un papillon d'un brun noir un peu violâtre, avec des taches blanches, petites, disposées à peu près comme dans *recurva*, sauf toutefois pour l'espace cellulaire des ailes supérieures où il y a un seul trait transversal assez épais, et pour la bande maculaire parallèle au bord terminal des inférieures, plus rapprochées de ce bord terminal.

“En dessous, l'aspect de la *Limenitis cleophas* est assez spécial. Les taches blanches du dessus sont reproduites, mais généralement un peu élargies; le fond des ailes est mélangé de brun chocolat foncé, de brun pâle et de gris. La cellule des supérieures est close par un trait noir vif, surmonté d'un trait fauve; au-dessous de la tache blanche cellulaire, entre deux traits noirs sinueux, on voit une tache fauve, et près de la base, encore dans l'espace cellulaire, un

- trait noir, au milieu d'un fond gris. Près de la base surtout, la côte est gris jaunâtre. Au-dessous de la nervure médiane, il y a une tache brune bordée de noir dans un espace gris.
- " Aux ailes inférieures, le bord anal est gris bleuâtre, ainsi que l'espace basilaire, jusqu'au près du bord costal qui est fauve. En deçà de la bande maculaire blanche transversale, il y a près du bord costal une tache chocolat foncé, à laquelle est juxtaposée une tache fauve lisérée de noir et pénétrée en dessous par une petite tache gris bleuâtre. Ces deux taches, celle qui est chocolat foncé et celle qui est fauve, sont toutes deux triangulaires et dirigent leur pointe en sens inverse.
- " Le dessous du corps est gris. Les pattes sont grises au premier article, ensuite un peu jaunâtres.
- " Tâ-Tsien-Lou et Mou-Pin. Nous ne connaissons pas la ♀ " (*Oberthür, l. c.*)

This species appears to be more nearly allied to *L. amphysa*, Ménières, than to *Athyma recurva*, Leech.

***Athyma recurva* (ante, p. 176).**

M. Oberthür (*Etud. d'Entom.* xviii, p. 17), referring to the female of this species, states that it only differs from the male in the greater expanse of the wings and in the enlargement of the white spots, especially on the primaries.

***Zizera christophi*.**

Lyceena christophi, Standinger, *Stett. ent. Zeit.* 1874, p. 87; Christoph, *Rom. sur Lép. i.* p. 102, pl. v. figs. 2 a, 2 b; Grun-Grshimailo, *op. cit.* iv, p. 376 (1890); Alphéraky, *op. cit.* v, p. 108 (1889).

Polyommatus sanudra, Moore, *Proc. Zool. Soc. Lond.* 1874, p. 574, pl. lxvii, fig. 2.

- " *Male*. Upperside pale lavender-blue, exterior margins and end of veins of both wings and anterior border of hind wing slightly fuliginous; costal edge white; cilia white, slightly brown at end of veins; abdominal margin greyish white; antenna black, ringed with white. Underside greyish white, slightly greenish at base of hind wings; fore wing with a discal transverse recurved row of black spots, each with a white border; a narrow white-bordered black streak at end of the cell, and a submarginal series of blackish lunules; hind wing with a series of eight small white-bordered black spots, two being near anterior margin towards the base, five on the disk, and one on abdominal margin; a pale-bordered short black streak at end and a dot within cell; a submarginal series of narrow black lunules with inner white borders and a marginal row of small metallic silvery spots, which are slightly bordered within with red.
- " *Female* differs above in having the wings anteriorly and the veins broadly fuliginous, and beneath in the partial absence of the discal series of spots on the hind wing.
- " Expanse, ♂ 1 $\frac{1}{2}$, ♀ 1 $\frac{3}{4}$ inch.
- " *Habitat*. Gol and Skardo, Baltistan." (*Moore, l. c.*)

Alphéraky states that a female specimen of this species was met with on

the 1st of July near the village of Houan-tchin, in the province of Kan-sou, and that it differed from typical examples in the absence of the metallic submarginal markings on under surface of secondaries; this form, however, he states, occurs occasionally among specimens from Askahabad.

In 1887 I took a long series of *L. samudra* in Ladak and Baltistan, where they were flying among bushes along the river-side. I find that all these specimens differ from *L. christophi* as figured (*l. c.*) in the following characters:—The blue coloration of both sexes is much more tinged with violet, and the female much more suffused with black. On the under surface of both sexes the transverse band of black spots on the primaries is not regularly curved as in *L. christophi*, and terminates in a double spot placed exactly below the one preceding it; the black spots of secondaries are not so well defined, and many of them are frequently absent. They appear to agree, however, with Standinger's description, and also with specimens of *L. christophi* sent me by M. Grun-Grshimailo from Dshaugaria.

Distribution. Persia, Pamir, Turkestan, Baltistan, Ladak, Thibet, and Northern China.

Satsuma leechi.

Thecla leechii, de Nicéville, Bomb. Nat. Hist. Soc. vii. p. 335 (1892).

Satsuma nicévillei, Leech, ante, p. 355.

“*Female.* Upperside: both wings pale blue. Fore wing with the costa broadly black, that colour reaching to the subcostal nervure; the apex very broadly and the outer margin also broadly but decreasingly black. Hind wing with the costa and apex rather broadly, the outer margin narrowly pale fuscous; a fine black anteciliary thread; the cilia cinereous. Under surface: both wings ferruginous, rather darker on the hind wing. Fore wing with an irregular darker discal line, commencing on the costa and ending on the first median nervure, outwardly defined with whitish; the inner margin broadly pale fuscous. Hind wing with very indistinct discal and submarginal lines; the abdominal margin and anal lobe heavily sprinkled with black scales. The upperside of this species agrees with the description of *S. chalybeia*, but the underside is ferruginous not grey, and the fore wing has no discoidal spot. The markings and ground-colour of the underside are almost exactly as in Japanese males of *S. frivaldskyi* [*?ferrea*, Butl.] in my collection, but the latter is considerably paler, and the former are far less distinct; whether these are specific or sexual differences I am unable to say.” (*de Nicéville, l. c.*)

Since describing *S. nicévillei* I find that M. de Nicéville has called his insects from the Khasi hills ‘*Thecla*’ *leechii*. If on comparison these specimens should prove to be identical with examples from Western China the synonymy of the species will be as above.

Genus CIGARITIS.

Cigaritis, Lucas, Ann. Soc. Ent. Fr. 1850, p. 98; Lang, Butt. Eur. p. 138 (1881).

- “*Caractères*. Antennes droites, légèrement annelées de blanc, terminées par une masse allongée fusiforme et tronquée à son extrémité; palpes très allongées, dépassant de beaucoup la tête; les premiers articles très grands, revêtus à leur partie inférieure de poils écailleux; le dernier beaucoup plus court, grêle, toujours bien distinct des précédents, terminé en pointe arrondie à son extrémité et à peine revêtu de poils écailleux; yeux de forme ovulaire, assez bombés et entourés de poils écailleux ordinairement blancs. Thorax assez robuste. Abdomen court, à moitié caché par les bords internes des inférieures qui ne forment pas gouttière dans l'état de repos. Cellules discoïdales des ailes supérieures et inférieures ouvertes. Ailes inférieures ayant le bord externe légèrement dentelé; Tangle anal assez profondément échancré, avec les côtés de cette échancrure ordinairement pourvus d'une petite queue; ailes supérieures et inférieures ordinairement ornées en dessous de petites taches métalliques. Crochets de tous les tarses petits.” (*Lucas, l. c.*)
- “Butterflies having very much the aspect of those of the genus *Polyommatus* [*Chrysothorax*]; the upper surface of the wings, however, have not the metallic coppery lustre of that genus. Beneath they are white, with various brown and silvery markings. The hind wings are strongly emarginate and often tailed.” (*Lang, l. c.*)

***Cigaritis acamas*.**

Lycæna acamas, Klug, Symb. Phys. pl. xl. figs. 7-9 (1831).

Cigaritis acamas, Lang, Butt. Eur. p. 138 (1881); Alphéraky, Rom. sur Lép. v. p. 104 (1889).

Polyommatus epargyros, Eversmann, Bull. Mosc. 1854, ii. p. 178, pl. i. figs. 1, 2.

- “Fulvous; fore wings with a black stripe running from the costa downwards, and three black costal stripes. Hind wings with two hind marginal tails, with blackish stripes and spots arranged parallel to the hind margins. Underside white, beautifully spotted and banded with brown and silver.
- “Expense 1.25 to 1.35 in.” (*Lang, l. c.*)
- Habitat*. Syria, Persia, Central Asia.

Alphéraky records several examples of both sexes taken between the 21st July and 9th August in the desert of Gobi and Mongolia, and states that they differ in no way from specimens from Russian Turkestan.

***Aporia lhamo*.**

Pieris lhamo, Oberthür, Etud. d'Entom. xviii. p. 13, pl. ii. fig. 27 (Nov. 1893).

- “Diffère d'*halisca*, Oberth., par le semis serré d'atomes noirs qui couvre la surface des ailes en dessus et des supérieures en dessous, tout en laissant les espaces intranervuraux moins foncés que le voisinage des nervures. Tché-kou (Thibet), R. P. Dubernard.
- “Nous possédons cinq exemplaires de *P. lhamo* bien semblables entre eux. Il se pourrait que ce fut une forme obscure d'*halisca*; cependant *halisca* se trouve à Tché-kou comme à Ta-Tsien-Lou.” (*Oberthür, l. c.*)

M. Oberthür suggests that this may be a melanic form of his *P. halisca* (= *Aporia proceris*, Lecch). He does not mention the sex of *A. thamo*, but I am inclined to think that it may prove to be the female of *A. proceris*, of which I have only received male examples. In coloration it differs from male *A. proceris* in the same manner that the female of *A. davidis* does from the male of that species.

Aporia potanini.

Aporia martineti, Oberthür, ? ♀, Alphéraky, Rom. sur Lép. v. p. 95, pl. v. fig. 1 (1889).
Aporia potanini, Alphéraky, loc. cit. p. 96.

Alphéraky considered that two female specimens of *Aporia* taken in July 1885, in the valley of the Heï-hò, province of Kan-sou, were probably the then unknown female of *Aporia martineti*, Oberth., but reserved to himself the name *potanini* in the event of their proving to be distinct; and this is now found to be the case.

In his remarks on these specimens, Alphéraky states that the neuration of the secondaries, the shape of the discoidal cell, which is broader and shorter than in *A. hippia*, Brem., also the comparative brevity of nerve eight, inclined him to think that they were females of *A. martineti*; at the same time he considered that they agreed better in many characters with the females of *A. cratagi*, with which they are identical in the neuration and shape of wings, but differ, however, in the dark grey coloration of both surfaces of the wings, and in having an ochreous yellow patch at the base of the secondaries on the under surface; moreover, there is no trace of the yellow coloration between the nerves so characteristic of *A. martineti*, *A. hippia*, and its variety *bieti*.

Mesapia peloria.

Pieris peloria, Hewitson, Exot. Butt. i., *Pier.* pl. ii. figs. 15, 16 (1853).

Mesapia peloria, Kirby, Cat. Diurn. Lep. p. 510 (1871).

Aporia peloria, Fixsen, Rom. sur Lép. v. p. 97 (1883).

* Upperside white, slightly tinged with yellow, the body and the base of the wings very black.

Anterior wing with the costal margin and the nervures broadly brown. Posterior wing with nervures black, the nervules tinted with lilac, the end of each marked with a large spot of brown upon the outer margin.

** Underside the same, except that the posterior wing is yellow, the nervules broadly brown, and that the base is marked with orange.

*** Expanse $1\frac{7}{10}$ inch. *Habitat*, Chinese Tartary.* (Hewitson, l. c.)

Alphéraky records a female specimen taken on the 11th July, 1885, on the Tchagola Mountains, in the province of Kan-sou, above the forest limit. He states that this example differs from those taken by the Przewalsky Expedition in N.E. Thibet, in being larger and narrower in the wing.

I received specimens of *M. pectoria* from Amdo, but I overlooked Alphéraky's record of this species from the province of Kan-sou (*ante*, p. 474).

Calliana pieridoides (*ante*, p. 557).

Calliana pieridoides, Moore; de Nicéville, Bomb. Nat. Hist. Journ. vi. p. 377, pl. G. fig. 25, ♀ (1891).

♀ *Female*. Upperside: both wings and cilia dull hair-brown. Fore wing with a very large oval spot occupying the outer end of the discoidal cell, but not quite reaching the discocellular nervules; a circular spot towards the base of the second median interspace, an oval spot, rather larger than the spot above it, in the middle of the first median interspace—these spots lustrous, semi-transparent white; the spot in the cell is anteriorly continued broadly to the costa in an opaque snow-white patch. Hind wing with the black spots of the underside showing through obscurely. Underside: both wings with the ground-colour a little paler than above, slightly washed with vinous. Fore wing with the spots as above, but with an additional small rounded opaque white spot in the middle of the submedian interspace placed somewhat near the outer margin. Hind wing with a large rounded black spot close to the outer end of the cell, with eight smaller black spots round the cell placed one in each interspace, of which the fourth, fifth, and seventh are smaller than the others. Thorax and abdomen concolorous with the wings. Palpi (all except the third joint, which is deep black) bright chrome-yellow.

♂ Though the female of this species differs so markedly in coloration from its brilliantly snow-white male, I have no doubt whatever that I have correctly paired the sexes. The position of the large spot at the end of the discoidal cell of the fore wing and the black spots on the disc of the hind wing is the same in both, otherwise the sexes are strikingly dissimilar in appearance. The palpi are bright chrome-yellow also in both sexes, all except the terminal joint; but the thorax of the female is brown throughout, while in the male it is anteriorly bright chrome-yellow. Mr. Doherty [*ante*, p. 558] was evidently perfectly correct in conjecturing that the female of this rare butterfly would be dark-coloured.

♂ Described from a single example in Mr. H. J. Elwes's collection obtained by the Rev. Walter A. Hamilton's native collectors in the Khasi hills, Assam. Mr. Hamilton has given me three males from the same locality." (*de Nicéville*, l. c.)

Hesperia tessellum.

Syrichthus tessellum, Hübnér; Lang, Butt. Eur. p. 339, pl. lxxviii. fig. 5 (1884).

♂ Expands from 1.25 to 1.30 in. Somewhat resembles [*H.*] *prato* above, but is larger, and its colouring is darker brown, without any green tinge: the spots are whiter and more distinct,

the marginal rows of spots being well defined. Underside brown, with a greenish tinge. Fore wings with two rows of oblong white spots, besides a white discal spot and another on the costa near the apex. Hind wings with a white central band and faintly white hind marginal and basal spot; fringes of the wings black and white.

“*Habitat*. Meadows in South Russia, Turkey, Asia Minor, and Persia.” (*Latag, l. c.*)

Alphéraky (Rom. sur Léop. v. p. 121) records a single female taken in June at Yau-myn-gouan, in the province of Chan-si, North China, which he says differs from typical specimens in the yellowish green coloration of the under surface of secondaries. This author makes no reference to *H. gigas*, Bremer, which has not hitherto been recorded from the region here dealt with, although it occurs in Central Asia as well as Amurland.

Dr. Staudinger, who formerly considered this species might be a form of *H. (P.) gigas*, Bremer, but has since altered his opinion, states that Graeser informed him that there were specimens of *H. tessellum* from Amurland in Tancr’s collection, but Dr. Staudinger seems inclined to doubt the accuracy of this statement.

Thanaos tages.

Thanaos tages, Boisduval, Sp. Gén. i. pl. xiii. fig. 8 (1836).

Nisoniades tages, Linnaeus; Lang, Butt. Eur. p. 348, pl. lxxxi. fig. 7 (1884).

Nisoniades tages, var. *sinina*, Grun-Grshimailo, Horæ Soc. Ent. Ros. 1891, p. 161.

“Expands from 1 to 1.25 in. Fore wings with the discal portion grey; near the costa is a large dark brown spot and another near the inner margin; there is a submarginal dark brown band, and a marginal band of a still darker colour, having whitish dots. This pattern is most marked in the male; in the female it is less distinct and paler. Hind wings dark brown, with a darker marginal band, on which are dots similar to those on the fore wings, and often some pale spots on the discal portion. Underside almost uniform brown, lighter than above. Fringes of all the wings brown and without spots. April and August.

“*Larva* tapering towards the extremities, bright green, with a yellow lateral stripe, and a second obscure line above the spiracles. Head brown. Feeds on *Lotus corniculatus* in May and September.

“*Pupa* green, tinged with red on the dorsal surface.” (*Latag, l. c.*)

Habitat. Europe; Western, Central, and N.E. Asia.

Var. *sinina*. “*Alis supra et subtus pallidioribus, griseo atomatis, maculis submarginalibus albis, ceteris distinctissimis. Fimbria multo pallidiore. In montibus ad Dougar-tschen detectus.*” (*Gr.-Gr., l. c.*)

According to Staudinger this must be a very rare insect in Amurland, as it has not been recorded from that region since Radde met with it. He also states that Herz found the species in North China, and the specimens differed

from European examples in the greater prominence of the white spots on the under surface, as is the case in specimens from Asia Minor. These North Chinese specimens appear to agree with the var. *sinina*, as described above, for examples of which from Sinin I am indebted to M. Grum-Grshimailo.



AINU BUCKLE OF WALRUS-BONE. (From Kurile Islands.)

I N D E X.

[Genera in black type; Genera in brackets following specific names have been used
by previous Authors.]

- abax, *Oberth.*, Pamphila (Carterocephalus), 587.
Abisara, *Feld.*, 296.
Abrota, *Moore*, 166.
 acacie, *Fabr.*, Thecla, 367, 368.
 acamas, *Klug*, Cigaritis, 658.
 aceris, *Lep.*, Neptis, 203.
Achalarus, *Scudder*, 559.
Achillides, *Hüb.*, = Papilio, 535.
 achine, *Scop.*, Pararge, 64.
 achinoides, *Bull.*, = Pararge achine, *Scop.*, 64.
 aerea, *Oberth.*, Metaporja (Pieris), 463.
Acrophthalmia, *Feld.*, 92.
 actius, *Eversm.* (Doritis), = Parnassius jacquemonti, *Boisd.*, var., 495.
 acuminata, *Feld.*, = Gonepteryx aspasia, *Mén.*, var., 443.
 acuta, *Moore*, Curetis, 349.
 adelma, *Feld.*, Isodema (Paraplesia), 116.
 adelma, *Mitt.*, = Delias samaca, *Moore*, var., 421.
 adipala, *Moore*, Neptis, 205.
 adippe, *Liun.*, Argynnis, 232.
Adolias (Sect. VI.), *Feld.*, = Dichorragia, *Bull.*, 132.
Adolias, *Westw.*, = Euthalia, *Hüb.*, 134.
Adopæa, *Bilb.*, 590.
 agina, *Gr.-Gr.*, Lycæna, 303.
 agon, *Schiff.*, Lycæna, 300.
 agonides, *Brem.*, = Lycæna cleobis, *Brem.*, 309.
Aeromachus, *de Nicé.*, 617.
 arope, *Leech*, Clerone, 112.
 atheria, *Eversm.*, = Melitæa phœbe, *Knoch*, var., 214.
 alfinis, *Stand.*, = Thecla eximia, *Fies.*, 359.
 agar, *Oberth.*, Melitæa, 218.
 agenor, *Liun.*, = Papilio memnon, *Liun.*, ♀, 544.
 agestor, *Gray*, Papilio (Cadogoides), 556.
 aglaia, *Liun.*, Argynnis, 239.
 aglaope, *Motsch.*, = Pieris melete, *Mén.*, var., 449.
 agna, *Moore*, Parnara (Hesperia), 607.
 agni (Vanessa), Grapta, 264.
 agnicula, *Moore*, = Grapta c-album, *Liun.*, var., 266.
 agrestis, *Oberth.*, Neope (Satyrus), 53.
 ajaka, *Moore*, = Pieris melete, *Mén.*, var., 454.
 albescens, *Oberth.*, Timelea, = Argynnis maculata, var. albescens, *Oberth.*, 246.
 albescens, *Ponj.*, = Ypthima zodia, *Bull.*, 91.
 albicans, *Leech*, = Neope agrestis, var., 54.
 albimacula, *Leech*, = Sepsis princeps, *Fies.*, var., 151.
 albipuncta, *Leech*, Callerebia, 102.
 albigstriga, *Mab.* (Scelothrix), = Hesperia zona, *Mab.*, var., 577.
 albivitta, *Oberth.*, = Halpe bivitta, *Oberth.*, 624.
 albidineta, *Ponj.*, Zophoessa (Delias), 45.
 albonaculata, *Leech*, Limenitis, 178, 655.
 aleinous, *Klug*, Papilio, 539, 542.
 aleippus, *Cram.*, = D. chrysipus, var., 5.
 almena, *Gr.-Gr.*, = Erebia sedakovi, var., 98, 99.
 alebion, *Gray*, Papilio, 522.
 alexis, *Fabr.*, Hasora, 638.
 alexis, *Wien. Verz.*, = Lycæna icarus, *Rott.*, 306.
 alliacmon, *de l'Orza*, = Papilio bianor, *Cram.*, var., 528.
 allous, *Hüb.*, = Lycæna astrarche, var., 315.
 almana, *Liun.*, Junonia, 282.
 alope, *Fenton* (Lycæna), = Zizera maha, *Koll.*, 325, 326, 327.
 alsus, *Wien. Verz.* (Lycæna), = Zizera minima, *Fies.*, 323.
 altissima, *Elwes*, Argynnis, 227.
 alveus, *Hüb.*, Hesperia (Syrichthus), 579.
 alvinda, *Blauch.* (Rhodocera), ? = Gonepteryx aspasia, *Mén.*, var., 442.

- alvina, *Brem.*, Neptis (Limenitis), 201.
 alysos, *Moore* (Plesioneura), = *Notocypta feisthamelii*,
Boisd., 627.
 amaryllis, *Cram.*, Cœnonympa, 95.
Amathusia, *Herr-Schaff.*, 122.
 amba, *Moore*, Neptis, 199.
 ambica, *Koll.*, Apatura, 155.
Amblopala, *Leech*, 341.
Amblypodia (auctorum), nec *Horsf.*, = *Arhopala*.
Boisd., 342.
Ameccera, *Bull.*, 67.
 aueria, *Hev.*, Mahathala (*Amblypodia*, *Narathura*),
 347.
 amintla, *Blanch.* (Rhodocera), = *Gonepteryx rhamnii*,
Lin., var., 440.
 amisenia, *Hev.*, Rapala (*Sirendra*, *Amblypodia*),
 346.
 amphysa, *Mén.*, Limenitis, 182.
 amurynsis, *Graeser.*, = *Gonepteryx rhamnii*, *Lin.*, var.,
 441.
 amurensis, *Mab.* (Pamphila), = *Augiades sylvanus*,
 602.
 amurensis, *Mén.*, = *Leucophasia sinapis*, *Lin.*, var.,
 482.
 amurensis, *Staud.*, = *Argynnis ino*, *Rott.*, var., 230.
 amurensis, *Staud.*, = *Sericinus telamon*, *Don.*, var.,
 489.
 anadyomene, *Feld.*, *Argynnis*, 240.
 ananta, *Moore*, Neptis, 197.
 andersoni, *Atk.*, *Zophoessa* (Debis), 45.
 androcles, *Doubl.*, Herda, 405.
 androgeos, *Cram.*, = *Papilio memnon*, *Lin.*, 544.
 anemone, *Feld.*, = *Teri is hecabe*, *Lin.*, 429.
 angelica, *Cram.*, = *Grapta* (*Vanessa*) *e-aureum*, *Lin.*,
 266.
 angulata, *Moore*, *Curetis*, 348.
 angustata, *Staud.*, = *Limenitis sibylla*, *Lin.*, var.,
 185.
 annulifer, *Bull.*, = *Cœnonympa odipus*, *Fabr.*,
 var., 94.
 anomala, *Koll.*, = *Parba* (*Acraea*) *vesta*, *Fabr.*, 115.
Anops, *Boisd.*, = *Curetis*, *Hüb.*, 348.
Anthocharis, *Boisd.*, 475.
 antiprone, *Leech*, Neptis, 192.
 antilope, *Leech*, Neptis, 195, 197.
 antiopa, *Lin.*, *Vanessa*, 256.
 antonia, *Bull.*, = *Gonepteryx rhamnii*, *Lin.*, var., 441.
 antonia, *Oberth.* (Limenitis), ? = *Neptis amba*, *Moore*,
 var., 199.
 amura, *de Nicè.*, *Hasora*, 639.
 anyte, *Hev.*, *Euthalia* (*Adolias*), 139.
Apatura, *Fabr.*, 153.
 aphirape, *Hüb.*, *Argynnis*, 222.
Aphæus, *Hüb.*, 409.
 apollo, *Lin.*, *Parnassius*, 499, 505.
Aporia, *Hüb.*, *Pontia*, *Fabr.*, *Bull.*, 467.
Apctictopterus, *Leech*, 630.
 aquilina, *Spyg.*, *Ismene*, 635.
 arachne, *Leech*, Neptis, 191.
Araschnia, *Hüb.*, 267.
 arata, *Brem.*, *Rapala* (*Thecla*), 365, 381, 416.
 arboretorum, *Oberth.* (Limenitis), = *Neptis pryeri*,
Bull., 206.
 arcana, *Leech*, *Everes* (*Lycæna*), 329.
 arcurus, *Westw.*, *Papilio*, 533.
 arete, *Cram.*, = *Lethe europa*, *Fabr.*, 20.
 arete, *Müll.*, = *Epinephle hyperanthus*, var., 80.
Arge, *Westw.*, = *Melanargia*, *Meigen*, 58.
 argentata, *Fiox.*, = *Melitea protomedea*, *Mén.*, var.,
 217.
 argentata, *Leech*, *Zophoessa*, 46.
 argia, *Mén.* (*Lycæna*), = *Zizera maha*, *Koll.*, var., 325.
 argiades, *Dill.*, *Everes* (*Lycæna*), 328.
 argus, *Bull.*, *Ypthima*, 90, 649.
 argus, *Lin.*, *Lycæna*, 301.
Argynnis, *Fabr.*, 221.
 argyrostigma, *Eversm.*, *Pamphila* (*Carterocephalus*),
 585.
 argyrotoxus, *Bergst.*, = *Lycæna ægon*, *Schiff.*, 309.
Arhopala, *Boisd.*, 342.
 ariana, *Moore*, = *Lycæna icarus*, *Rott.*, var., 307.
 arion, *Lin.*, *Lycæna*, 315.
 aristobachia, *Fabr.*, *Papilio* (*Menelaides*), 554.
 arnandi, *Oberth.*, *Davidina*, 474.
Armandia, *Blanch.*, *Bhutanitis*, *Atkinson*, 489.
 armandia, *Oberth.*, Neptis, 194, 195.
 armandiana, *Pouj.*, *Euthalia*, = *Adolias kardama*,
Moore, 136.
 arnandii, *Oberth.*, *Neope* (*Satyrus*), 59.
 arnandina, *Oberth.*, *Zophoessa* (Debis), 43.
 arsilache, = *Argynnis pales*, *Schiff.*, var., 224.
 artemis, *Wien. Verz.*, = *Melitea aurinia*, *Rott.*, 212.
 arvensis, *Oberth.*, *Epinephle* (*Satyrus*), 78.
 asiatica, *Elves.*, = *Lycæna pheretes*, *Hüb.*, var., 306.
 asiatica, *Mén.*, = *Papilio machaon*, *Lin.*, var., 516.
 aspasia, *Mén.*, *Gonepteryx*, 442.
 aspasia, *Leech*, Neptis, 193.
 aspersa, *Leech*, *Celaenorrhinus*, 571.
 assama, *Westw.*, *Clerome*, 113.
 assinilis, *Lin.*, *Hestia*, 143.
 asterie, *Lin.*, *Janonia*, 280.
 asthala, *Moore*, *Symbrenthia*, 285.
Astictopterus, *Feld.*, 629.
 astrea, *Leech*, = *Satyrus dryas*, *Scop.*, var., 70.

- astrache, *Bergst.*, Lycæna, 315.
Astycus, *Catal. Frank.*, = Telicota, *Moore*, 600.
 asura, *Moore*, Athyma, 169.
 aswa, *Moore*, Melanitis (Cylio), 108.
 atalanta, *Linna.*, Pyrameis (Vanessa), 252.
 ataxus, *Hew.*, Zephyrus (Dipsos), 374.
Atella, *Doubl.*, 207.
 athalia, *Rott.*, Melitea, 214.
Athyma, *Westw.*, 167.
 atticus, *Fabr.*, Tazianes (Hesperia), 573.
 attilia, *Brem.*, Zephyrus (Thecla), 392.
 augiades, *Feld.*, Telicota, 600.
Augiades, *Hübner.*, 601.
 augias, *Linna.*, Telicota (Hesperia), 600.
Aulocera, *Bull.*, 70.
 auratus, *Leech.*, = Chrysophanus dispar, *Haw.*, var., 308.
 aurelia, Melitea, 213.
 auriuia, *Rott.*, Melitea, 212.
 aurorina, *Oberth.*, = Zephyrus taxila, *Brem.*, var., 370.
 austeni, *Moore*, Parnara (Baoris), 613, 614.
 australis, *Boisd.*, = Danaüs hamata, *McLeay*, 4.
 australis, *Graeser.*, = Argynnis oscarus, *Eversm.*, var., 222.
 australis, *Leech.*, = Hestia japonica, *Feld.*, var., 146.
 autonoe, *Esper.*, Satyrus, 69.
 avanta, *Moore*, Ypthima, 89.
 avanti, de *Nicée.*, Pamphila, 586.
 avatara, *Moore* (Satyrus), = Aulocera padma, *Koll.*, 71.
 avidiæna, *Hew.*, Amblyopala (Amblypodia), 341.
 badra, *Moore*, Hasora, 637, 639.
 balbita, *Moore*, Melitea, 218.
 baldus, *Fabr.*, Ypthima, 90.
 bambuseæ, *Moore*, Telicota (Pamphila), 600.
 bambusarum, *Oberth.*, Anthocharis, 477, 478.
Baoris, *Moore*, 616.
 baralacha, *Moore*, = Argynnis pabes, *Schiff.*, var., 224.
 barine, *Leech.*, Lycæna, 304.
 bathycles, *Zink.*, Papilio, 525.
 battus, *Hübner.*, = Lycæna orion, *Pall.*, 300.
 baneis, *Leech.*, Lethæ, 22.
 bavius, *Eversm.*, Lycæna, 310.
 beautei, *Oberth.*, Ypthima, 85.
 beavani, *Moore*, Parnara, 610.
 bela, *Moore*, Melanitis, 652.
 belladonna, *Fabr.*, Delias (Pieris), 418.
 bellidice, *Ochs.*, = Synchlœ daplidice, var., 459.
 bellona, *Leech.*, Melitea, 219.
 benjamini, *Güérin*, Rhopalocampa (Ismene, Choas-
 pes), 641.
 bernardus, *Fabr.*, = Charaxos polyxena, *Cram.*, var., 125.
 berœe, *Cram.*, = Lethæ europa, 20.
 berœe, *Leech.*, Neptis, 193.
 bethesba, *Jans.*, = Terias leta, *Boisd.*, var., 426.
 betule, *Linna.*, Zephyrus (Thecla), 383.
 betuloides, *Bull.* (*Blauch. in litt.*), = Rapala micanus,
Brem., var., 415.
 bhairava, *Moore*, Lethæ, 31.
Bhutanitis, *Atkinson*, Armanlia, *Blauch.*, 489.
 bianor, *Cram.*, Papilio, 527.
 biblina, *Godart.*, = Cethosia liblis, *Drury*, 129.
 biblis, *Drury*, Cethosia, 120.
 bieti, *Oberth.*, Anthocharis, 478.
 bieti, *Oberth.*, = Apatura iris, *Linna.*, var., 157, 160.
 bi-eti, *Oberth.*, Epim-phete, 79.
 bieti, *Oberth.*, Hesperia (Strycthus), 578.
 bieti, *Oberth.* (Pieris), = Aporia hippia, *Brem.*, var., 470, 471.
 bieti, *Oberth.*, Zephyrus (Thecla), 381.
 bifasciatus, *Brem. & Grey.*, Achalarus (Eudamus,
 Goniloba), 590.
 bifornis, *Pryer.*, = Terias leta, *Boisd.*, 427.
 bipunctatus, *Motsch.*, = Satyrus dryas, *Scop.*, var., 69.
 bivitta, *Oberth.*, Halpe (Pamphila), 623.
 blanchardii, *Mab.*, Halpe (Hesperilla), 625.
 bochus, *Cram.*, Jamides, 334.
 bocki, *Oberth.*, Callerebia, 651.
 boetiens, *Linna.*, Polyommatus (Lycæna), 337.
 bolina, *Linna.*, Hypolyminas, 130.
 bootes, *Westw.*, Papilio, 551.
 borealis, *Feld.*, = Mycalesis gotama, 14.
 borealis, *Feld.*, = Papilio polytes, *Linna.*, var., 553.
 bouddha, *Mab.*, Augiades (Pamphila), 603.
 brahma, *Moore*, Herla, 405, 406.
 brabma, *Bull.*, = Calinaga buddha, *Moore*, 118.
 brahminis, *Blauch.*, Aulocera (Satyrus), 73.
 brassice, *Pieris*, 455, 457.
 bremeri, *Feld.*, Neope (Lasionmata), 51.
 brilliantina, *Staud.*, Zephyrus (Thecla), 373.
 brisanda, de *Nicée.*, Lethæ, 20.
 bromus, *Leech.*, Parnara, 614.
 bryonia, *Ochs.*, = Pieris napi, var., 453.
 buchananii, de *Nicée.*, Celenorrhinus, 572.
 buddha, *Gr.-Gr.*, Eneis, 6.
 buddha, *Oberth.* (nec *Moore*), = Calinaga davidis,
Oberth., 118.
 buddha, *Moore*, Calinaga, 118.
 bulis, *Doubl.*, Curvis, 318.
 bunea, *Herr.-Schaff.*, = Apatura ilia, *Wien. Verz.*,
 var., 161.
 burcjana, *Brem.*, Araschnia (Vanessa), 270.

- butleri, *Fenton*, Zephyrus (Thecla), 393.
 butleri, *Leech*, Lethe, 24.
 butleri, *Moore*, Synchlœ, 459.
Byasa, *Moore*, = Papilio, 537.
- c-album, *Linnaeus*, Grapta (Vanessa), 263.
 c-aureum, *Linnaeus*, Grapta (Vanessa), 266.
 cacheniriensis, *Oberthaus*, = Parassius epaphus, *Oberthaus*, var., 492, 494, 536.
Caduga, *Moore*, 1.
Cadugoides, *Moore*, = Papilio, 556.
 canis, *Leech*, Halpe, 625.
 cerulea, *Bremus*, (Thecla), = Rapala micans, *Bremus*, 414.
 cerulescens, *Mabius*, Parara (Pamphila), 615.
 cerulescens, *Motschulsky*, (Thecla), ? = Satsuma ferrea, *Buller*, 353.
 cubira, *Moore*, Hesperia, 613.
Calinaga, *Moore*, 117.
 calisto, *Leech*, = Lethe violaceopicta, *Ponjard*, 39, 40.
Callarge, *Leech*, 57.
Callerebia, *Buller*, 101.
Calliana, *Moore*, 557.
 callidice, *Esper*, Synchlœ (Pieris), 458, 459.
Callidryas, *Hübner*, 423.
 calligma, *Buller*, Tagiades, 574.
 callipteris, *Buller*, Lethe (Neope), 35, 36.
 callirhoë, *Hübner*, = Pyrameis indica, *Herbst*, 252.
Calysisme, *Moore*, = Mycalesis, 12.
Camena, *Hewson*, 359.
 camilla, *Esper* (nec *Linnaeus*), = Neptis lucilla, *Hübner*, 206.
 camilla, *Leech*, Lethe, 31.
 campana, *Leech*, = Epinephele arvensis, *Oberthaus*, var., 79.
 canace, *Linnaeus*, Vanessa, 255.
 canidia, *Sparmann*, Pieris, 455.
 carbonaria, *Gravenhorst*, = Thecla tengstromi, *Erschler*, var., 369.
 cardamines, *Linnaeus*, Anthocharis (Euchloe), 476, 478.
 cardinal, *Gravenhorst*, = Parassius delphinus, var., 504.
 carduelis, *Cramer*, = Pyrameis cardui, *Linnaeus*, 251.
 cardui, *Linnaeus*, Pyrameis (Vanessa), 251.
 carola, *Oberthaus*, Callerebia, 651.
 carpenteri, *Buller*, = Papilio demetrius, *Cramer*, 546.
Carterocephalus, *Leech*, = Pamphila, *Fabr.*, 585.
 carthami, *Hübner*, (Scelothrix), Hesperia, 575.
 cassiope, *Ménétrières*, (Athyma), = Apatura nycteis, *Ménétrières*, ab., 155.
Castalia (*Boisduval*, MS.), *Horsford & Moore*, = Sephisa, *Moore*, 150.
 castetsi, *Oberthaus*, = Argynnis niphæ, *Linnaeus*, var., 244.
 catena, *Leech*, Pararge, 64.
Catochrysops, *Boisduval*, 335.
 catocycana, *Mabius*, Aeromachus (Pamphila), 618.
Catopsilia, *Hübner*, 423.
 caucasica, *Staudacher*, = Melitea phebe, *Knoch*, var., 214.
 cauta, *Leech*, = Sephisa princeps, *Fries*, 151.
 celano, *Leech*, = Satyrus autonoe, *Esper*, var., 69.
Celenorrhinus, *Hübner*, 569.
 centralis, *Staudacher*, = Papilio machaon, *Linnaeus*, var., 518.
Cethosia, *Fabr.*, 119.
 chalybeia, *Leech*, Satsuma, 352, 355.
 chandala, *Moore* (Polymnatus), = Zizera maha, *Kollar*, 325.
 chandica, *Moore*, Lethe (Debis), 19.
 chandra, *Moore*, Sephisa, 151.
 chandrua, *Moore*, Sinthusa (Hypocycæna), 395.
Chapra, *Moore*, = Parara, *Moore*, 606.
Charaxes, *Ochsenheimer*, 123.
 charis, *Oberthaus*, = Argynnis gong. *Oberthaus*, var., 224.
 charonda, *Hewson*, Euripus (Diadema), 148.
 charonia, *Drury*, = Vanessa canace, *Linnaeus*, 255.
Charus, *Moore*, = Papilio, 548.
 cheatsong, *Oberthaus*, = Papilio nevilli, *Walden-Mason*, var., 543.
 chevana, *Moore*, Apatura (Athyma), 155.
 childreni, *Gray*, Argynnis, 243.
 chinensis, *Feldner*, = Chrysophanus phœas, *Linnaeus*, var., 389, 400.
 chinensis, *Leech*, = Hestina japonica, *Feldner*, var., 146.
 chinensis, *Leech*, = Luchdornia japonica, *Leech*, var., 491.
 chinensis, *Leech*, = Neptis ananta, *Moore*, var., 198.
 chinensis, *Leech*, = Vanessa urticae, *Linnaeus*, var., 258.
 chinensis, *Leech*, = Ypthima newara, *Moore*, var., 89, 646.
 chinensis, *Leech* (Cyclopides), = Astictopterus olivaceus, *Moore*, 629.
 chinensis, *Murray*, Lycæna, 315.
 chione, *Feldner*, Acrophthalmia, 93.
Chionobas, *Westwood*, = Gneiss, *Hübner*, 74.
 chloridice, *Esper*, Synchlœ (Pieris), 459.
Choaspes, *Moore*, = Rhopalocampa, *Wallengr.*, 640.
 christi, *Oberthaus*, Neope, 49.
 christophi, *Leech*, Lethe, 30.
 christophi, *Gravenhorst*, (Carterocephalus), = Pamphila niveomaculatus, *Oberthaus*, var., 588.
 christophi, *Staudacher*, Zizera (Lycæna), 656.
 chromus, *Cramer*, Masora (Parata, Goniloba), 638.
 chryseglia, *Buller* (Proteides), = Ismene aquilina, *Snyder*, 655.

- chrysidice, *H.-S.*, = *Pieris callidice*, *Esp.*, var., 460.
 chrysipus, *Lin.*, *Danais*, 5.
Chrysophanus, *Hüb.*, 396.
 chrysus, *Oberth.* (*Apatura*) = *Dilipa fenestra*, *Leech*, 165.
Cigaretis, *Lucas*, 658.
 cilix, *Dist.*, *Papilio*, 544.
 ciocolatina, *Ponj.*, *Limenitis*, 186.
 circe, *Leech*, *Satsuma*, 352, 353, 354.
 ciris, *Leech*, *Ypthima*, 85.
 cisseis, *Leech*, *Pieris*, 455.
 citrinarius, *Motseh.*, *Parnassius*, 506.
 clara, *Blauch.*, *Argynnis*, 227.
 claripennis, *Butl.* (*Synchlœ*) = *Pieris canidi*, var., 455.
 cleobis, *Brem.*, *Lycæna*, 309.
 cleobule, *Hüb.*, = *Gonepteryx rhamnii*, *Lin.*, var., 441.
 cleodoxa, *Ochs.*, = *Argynnis adippe*, *Lin.*, var., 233.
 cleopatra, *Lin.*, = *Gonepteryx rhamnii*, *Lin.*, var., 441.
 cleophas, *Oberth.*, *Limenitis*, 655.
Clerome, *Westw.*, 112.
 clinia, *Oberth.*, = *Ypthima ciris*, *Leech*, 85.
 clinoides, *Oberth.*, *Ypthima*, 85.
 clithron, *Oberth.*, = *Charaxes posidonius*, *Leech*, 127.
 cloanthus, *Westw.*, *Papilio*, 523.
 clymenus, *Leech*, = *Papilio cloanthus*, *Westw.*, var., 523.
 clytie, *Wien. Verz.*, = *Apatura ilia*, *Wien. Verz.*, var., 161.
 enejus, *Fabr.*, *Catochrysops* (*Lycæna*), 335.
 celestis, *Leech*, = *Lethe chandica*, var., 20.
 celestis, *Leech*, *Zephyrus* (*Thecla*), 383.
 celigena, *Oberth.*, *Lycæna*, 312.
Cœnonympa, *Hüb.*, 93.
 cognata, *Staud.* (*Thecla*) = *Zephyrus orientalis*, *Murray*, var., 376, 378.
 colaca, *Moore*, *Parnara*, 609.
Coladenia, *Moore*, 567.
Colias, *Boisd.*, 431.
 columbina, *Cram.*, = *Atella phalanta*, *Drury*, 208.
 comes, *Leech*, *Zephyrus* (*Dipsas*), 388.
 comma, *Lin.*, *Erynnis* (*Hesperia*), 593.
 confucius, *Feld.* (*Pamphila*) = *Padraona dara*, *Koll.*, var., 536.
 confucius, *Leech*, *Mycælesis mineus*, var., 12.
 confucius, *Westw.*, *Euthalia* (*Adolias*), 135.
 conjuncta, *Leech*, *Ypthima*, 82.
 connexa, *Butl.*, = *Vanessa urticae*, *Lin.*, var., 257, 258.
 connexiva, *Butl.*, = *Terias hecabe*, *Lin.*, var., 429.
 consanguinea, *Leech*, *Celaenorrhinus*, 570.
 consanguis, *Butl.*, = *Lethe diana*, *Butl.*, 28.
 consimilis, *Westw.*, *Hestina*, 143.
 consobrina, *Leech*, *Euthalia*, 140.
 consors, *Leech*, = *Angiades boudlha*, *Mab.*, var., 604.
 constricta, *Alph.*, = *Athyia opalina*, *Koll.*, var., 170, 172.
 contracta, *Butl.*, = *Catochrysops enejus*, *Fabr.*, 337.
 contractus, *Leech* (*Iolaus*) = *Camena icetas*, *Hev.*, 350.
 contractus, *Leech*, = *Achalarus bifasciatus*, *Brem.* & *Grey*, var., 500.
 coreana, *Butl.*, = *Argynnis nerippe*, *Feld.*, 231, 235.
 coreanus, *Leech*, = *Euripus charonda*, *Hev.*, var., 148, 149.
 coreidippe, *Leech*, = *Argynnis adippe*, *Lin.*, var., 233.
 coretas, *Ochs.* (*Lycæna*) = *Everes argiades*, *Pall.*, var., 320.
 couruscans, *Leech*, *Zephyrus*, 373.
 cottini, *Oberth.*, *Limenitis*, 180.
 crassa, *Leech*, = *Zephyrus betulae*, *Lin.*, var., 384.
 cratægi, *Lin.*, *Aporia*, 471, 473.
 cratægioides, *Lucas* (*Leuconea*) = *Aporia hippia*, *Brem.*, 471.
 crataeis, *Leech*, *Angiades*, 603.
 cressonii, *Reak.*, = *Sericinus telamon*, var., 486.
 crishna, *Westw.*, *Neorina* (*Cylo*), 17.
 crisilda, *Hev.*, *Ragadia*, 92.
 crocale, *Cram.*, *Catopsilia*, 424.
 crucivora, *Boisd.*, = *Pieris rapæ*, *Lin.*, var., 457.
Ctenoptilum, *de Nicéville*, 574.
 ctesia, *Hev.*, *Camena*, 351.
Curetis, *Hüb.*, 348.
 curius, *Fabr.*, *Leptocercus* (*Erycina*), 509.
 curvifascia, *Feld.*, *Notocrypta* (*Plesioneura*), 626.
 cybele, *Leech*, *Lethe*, 643. *Сyβeлe 723, 317*.
 cydippe, *Leech*, *Neptis*, 196.
 cyllarus, *Rott.*, *Lycæna*, 312.
Cylo, *Boisd.*, 17.
Cylo, *Boisd.*, = *Melanitis*, *Fabr.*, 165.
 cyrene, *Leech*, *Lethe*, 37.
Cyrestis, *Boisd.*, 247.
 dahurica, *Graeser*, = *Chrysophanus di-par*, *Haw.*, var., 397, 398.
Daimio, *Murray*, 563.
Dalchina, *Moore*, = *Papilio*, 524.
 dan, *Fabr.*, *Coladenia* (*Hesperia*), 567.
Danais, *Latr.*, 4.
 danava, *Moore*, *Limenitis*, 188.
 daphne, *Schiff.*, *Argynnis*, 229.
 dapidice, *Lin.*, *Synchlœ* (*Pieris*), 458.

- dara, *Koll.*, Padraona (Hesperia), 596.
 daruka, *Moore*, = *Symbrenthia hippoclus*, *Cram.*, var., 284.
 davidii, *Oberth.*, Lethæ (Debis), 29.
 davidii, *Oberth.*, = *Thecla tengstromii*, *Ersch.*, var., 348.
 davidii, *Ponj.*, Everes (Lycæna), 332.
 davidianus, *Ponj.* (Satyrus), = *Lethæ lunaris*, *Bull.*, 25.
 davidii, *Mab.*, *Celaenorhinus* (Pterygospidæa), 572.
Davidina, *Oberth.*, 474.
 davidina, *Oberth.*, = *Aporia davidis*, *Oberth.*, var. venata, *Leech.*, 469.
 davidis, *Oberth.*, *Aporia* (Pieris), 468.
 davidis, *Oberth.*, *Calinaga*, 118.
 davidis, *Oberth.*, = *Parnassius nomion*, *Fisch.*, var., 498, 500, 501.
 davidis, *Ponj.*, *Araschnia*, 274.
 davus, *Fabr.*, = *Ctenonympha typhon*, *Rott.*, 96.
 dea, *Leech.*, = *Coladenia dan*, *Fabr.*, var., 568.
Debasa, *Moore*, = *Papilio*, 555.
Debis, *Westw.*, = *Lethæ*, 18.
 debaani, *Feld.*, = *Papilio biamor*, *Cram.*, var., 528.
 deidamia, *Eversm.*, Pararge, 65.
 deiphobe, *Leech.*, *Epinephele*, 650.
 dejanira, *Lin.*, Pararge, 64.
 delai-lama, *Mab.*, *Aeromachus* (Cyclopædæ), 620.
 delavayi, *Oberth.* (Callerbia), = *Erebica ruricola*, *Leech.*, 100.
 delavayi, *Oberth.* (Syrichtus), = *Hesperia oberthuri*, *Leech.*, 579.
 delavayi, *Oberth.*, *Metaporis* (Pieris), 463.
Delias, *Hüb.*, 418.
 delphius, *Eversm.*, *Parnassius* (Doritis), 504.
 demea, *Oberth.* (Cartrocephalus), = *Pamphila gemmatus*, *Leech.*, 588.
 demetrius, *Cram.*, *Papilio*, 546.
 dentata, *Moore*, = *Caretis bulis*, *Doubl.*, var., 349.
Dercas, *Boisd.*, 445.
 desfontainesii, *Eversm.*, = *Melitæa aurinia*, *Rott.*, var., 212.
 desfontainii, *Godart.*, = *Melitæa aurinia*, *Rott.*, var., 212.
 desgodinsi, *Oberth.*, *Zephyrus* (Thecla), 374.
Deudorix, 413.
 dhanada, *Moore*, *Notoecrypta* (Plesioneura), 629.
Diadema, *Westw.*, 140.
Diadema, part., = *Hypolymnas*, *Hüb.*, 128.
 diadora, *Hew.* (Diadema), = *Hestina japonica*, *Feld.*, 146.
 dialis, *Leech.*, *Papilio*, 532.
 diamantina, *Oberth.* (Thecla), = *Zephyrus smaragdinus*, *Brem.*, 372.
 diana, *Bull.*, *Lethæ* (Debis), 28.
Dichorragia, *Bull.*, 132.
 dichroa, *Koll.*, *Sephisa* (Castalia), 151.
 dictynna, *Espér.*, *Melitæa*, 217.
 didyma, *Espér.*, *Melitæa*, 211.
 dilusa, *Leech.*, = *Athyma fortuna*, *Leech.*, var., 173.
Dilipa, *Moore*, 165.
 diluta, *Feld.* (Lycæna), = *Zizera naba*, *Koll.*, 327.
 dilutior, *Fies.*, = *Argynnis selene*, *Hüb.*, var., 223.
 dimila, *Moore*, = *Erynnis comma*, var., 595.
 diocles, *Moore*, *Asiactopterus*, 631.
 diphilus, *Espér.*, = *Papilio aristolochiæ*, *Fabr.*, 554.
Dipsas (part.), *Westw.*, = *Zephyrus*, *Dalm.*, 339.
 discalis, *Moore*, = *Caretis bulis*, *Doubl.*, var., 349.
 disjuncta, *Leech.*, *Athyma*, 175.
 dispar, *Haworth.*, *Chrysophanus* (Polyommatus), 397.
 disimilis, *Papilio*, 556.
 distorta, *Niccè.*, *Zinaspis* (Rapala), 546.
 diversa, *Leech* (Pterygospidæa), = *Paimio narada*, *Moore*, 563.
 divina, *Fies.*, *Lycæna*, 314.
Dodona, *Hew.*, 290.
 delop-, *Feld.* (Adolias), = *Stibochiona nicea*, *Gray.*, 153.
 doris, *Leech.*, *Araschnia*, 272.
 dreamon, *Oberth.*, *Ypthima*, 85.
 dromonides, *Oberth.*, = *Ypthima iris*, *Leech.*, 84.
 dryas, *Scop.*, *Satyrus*, 69.
 dubernardi, *Oberth.*, *Aporia* (Pieris), 467.
 duda, *Staud.*, *Euthalia*, 138.
 dulcinea, *Bull.* (Gnathis), = *Pieris melete*, *Mén.*, var., 450.
 dumetorum, *Oberth.*, Pararge, 61.
 dunicola, *Oberth.*, *Rhaphicera* (Satyrus), 56.
 duplicata, *Staud.*, = *Limenitis helmanni*, *Led.*, var., 184.
 dura, *Marsh.*, *Zophoessa*, 47.
 durga, *Koll.*, *Dodona* (Melitæa, Taxila), 291.
 duryodana, *Feld.*, *Melanitis*, 107.
 dyrta, *Feld.*, *Lethæ* (Debis), 21.
 edusa, *Fabr.*, *Colias*, 438.
 eleus, *Fabr.*, = *Chrysophanus phleas*, *Lin.*, var., 399, 400.
 eligius, *Cram.*, *Celaenorhinus* (Plesioneura), 569.
 ella, *Brem.*, = *Argynnis anadyomene*, *Feld.*, 240.
 ella, *Bull.*, = *Catochrysope enejus*, *Fabr.*, 337.
 eltolta, *Hew.*, *Parura* (Hesperia), 613.
 elwesi, *Bull.*, = *Colias hyale*, *Lin.*, var., 432.
 elwesi, *Leech.*, = *Athyma asura*, *Moore*, var., 170.

- elwesi, *Leech*, *Papilio*, 550.
 elwesi, *Leech*, = *Parnassius delphius*, *Eversm.*, var., 504.
 elwesi, *Leech*, *Ypthima*, 645.
 elwesi, *Leech*, = *Zephyrus betule*, var., 384.
 elwesi, *Oberth.*, *Limenitis*, 170.
Enispe, *Westw.*, 110.
 enthea, *Jans.*, *Zephyrus* (*Thecla*), 391.
 epaminondas, *Staud.* (*Pararge*), = *L.*? *epimenides*, var., 19.
 epaphus, *Oberth.*, *Parnassius*, 492, 494, 495, 497, 498.
 epicles, *Godart*, *Herda* (*Polyommatus*, *Thecla*), 408.
 epimenides, *Mén.*, *Lethe*? (*Lasiommata*), 19.
Epinephele, *Hüb.*, 77.
 episcopalus, *Oberth.*, *Pararge*, 62.
 epycides, *Hev.*, *Papilio*, 555.
 erate, *Murray*, = *Colias hyale*, *Linn.*, var., 431.
 erato, *Boisd.* (*Taxila*), = *Dodona onida*, *Moore*, 202.
Erebia, *Dalman*, 97.
 erelina, *Bull.*, = *Pararge deidamia*, *Eversm.*, var., 65, 66.
 eribus, *Gr.-Gr.*, = *Thanaos pelias*, *Leech*, 581.
 erithonius, *Cramer*, *Papilio*, 554.
 eros, *Ochs.*, *Lycena*, 308.
 erute, *Boisd.*, *Pouj.*, = *Pieris melete*, *Mén.*, var., 450.
Erynnis, *Schrank*, 593.
 erysinii, *Hüb.*, = *Leucophasia sinapis*, var., 481, 483.
 esperi, *Bull.*, *Papilio*, 544.
Euchloë, *Hüb.*, = *Anthocharis*, *Boisd.*, 470.
 eugenes, *Bates*, *Dodona*, 292.
 eugenia, *Eversm.*, *Argynnis*, 226.
 eumedon, *Esper*, *Lycena*, 307.
 euphemia, *Staud.*, = *Lycena euphemus*, *Hüb.*, var., 313, 314.
 euphemus, *Hüb.*, *Lycena*, 313.
Euralia, *Westw.*, = *Hypolyminas*, *Hüb.*, 128.
Euripus, *Westw.*, 147.
 europa, *Fabr.*, *Lethe* (*Debis*), 20.
 eurous, *Leech*, *Papilio*, 521.
 eurydice, *Leech*, = *Pieris extensa*, *Pouj.*, var., 454.
 eurynome, *Westw.* (*Limenitis*), *Neptis*, 202, 203.
Euthalia, *Hüb.*, 134.
 euthymius, *Doubl.*, *Enispe*, 111.
 eva, *Gr.-Gr.*, = *Argynnis gong.*, *Oberth.*, var., 224, 226.
 evanesceus, *Alph.*, = *Cænonympha amaryllis*, *Cram.*, var., 46.
 evanesceus, *Bull.*, *Ypthima*, 90.
Everes, *Hüb.*, 328.
 excellens, *Bull.*, *Neptis*, 200.
 eximia, *Fics.*, *Thecla*, 359, 365.
 extensa, *Leech*, = *Grapta e-album*, *Linn.*, var., 265.
 extensa, *Leech*, = *Neptis mahendra*, var., 202.
 extensa, *Pouj.*, *Pieris*, 454.
 extrema, *Alph.*, = *Satyrus antonoi*, *Esper*, var., 69.
 fallax, *Jans.*, *Araschnia*, 270, 272, 273.
 farinosa, *Zell.*, = *Gonopteryx rhamnii*, *Linn.*, var., 441.
 fasciata, *Jans.* (*Thecla*), = *Zephyrus taxila*, *Brem.*, var., 370.
 fasciatus, *Brem.*, = *Sericinus telamon* ♂, 485, 487.
 fasciola, *Leech*, *Apatna*, 159.
 fatih, *Koll.* (*Hesperia*), = *Coladenia dan*, *Fabr.*, 567.
 faunus, *Edw.*, *Grapta* (*Vanessa*), 265.
 feisthamelii, *Boisd.*, *Notocrypta* (*Thymelo*), 627.
 felderi, *Bull.*, = *Dainio sinica*, *Feld.*, 565.
 felderi, *Leech*, = *Neope muirheadii*, *Feld.*, var., 54.
 felicias, *Oberth.*, *Lycena*, 307.
 fenestra, *Leech*, *Dilija* (*Vanessa*), 165.
 fentoni, *Bull.*, = *Grapta e-album*, *Linn.*, var., 263, 264.
 fentoni, *Bull.* (*Neope*), = *Lethe*? *epimenides*, 19.
 fentoni, *Bull.* (*Strymon*), = *Thecla w-album*, *Kuech.*, 358.
 ferrea, *Bull.*, *Satsuma* (*Lycena*, *Thecla*), 353.
 fieldii, *Mén.*, *Colias*, 438.
 filicandis, *W. B. Fryer*, *Everes* (*Lampides*), 331.
 fignal, *Herbst.*, = *Argynnis euphrosyne*, *Linn.*, var., 222.
 fischeri, *Eversm.*, *Everes* (*Lycena*), 311, 330.
 fixseni, *Leech*, = *Thecla eximia*, *Fics.*, var., 360, 365.
 fixseni, *Staud.*, = *Sericinus telamon*, *Don.*, var., 487.
 flamen, *Leech* (*Dipsas*), = *Zephyrus raphaelis*, *Oberth.*, var., 390.
 flava, *Murray* (*Hesperia*), = *Padraona dara*, *Koll.*, var., 596.
 flavalba, *Marsh.*, = *Delias sanaca*, *Moore*, 421.
 flavofasciata, *Leech*, = *Lethe davidi*, *Oberth.*, var., 39.
 flavoides, *Leech*, *Taractroera*, 590.
 flavomaculata (-us), *Oberth.*, *Pamphila* (*Carterocephalus*), 587.
 flegyas, *Cram.*, *Zomeros*, 290.
 flesus, *Fabr.* (*Pterygospidea*), *Tagiades*, 573.
 florinda, *Bull.* (*Pamphila*), = *Erynnis comma*, *Linn.*, var., 504.
 fortuna, *Jans.*, *Argynnis aglaia*, *Linn.*, var., 230, 231.
 fortuna, *Leech*, *Athyma*, 173.
 fortunici, *Feld.* (*Hesperia*), = *Parnara guttatus*, *Brem.* & *Gray*, 603.
 fortunici, *Gray*, = *Sericinus telamon*, *Don.*, var., ♀, 486.
 francica, *Gray*, *Euthalia* (*Adolias*), 138.

- frater, *Oberth.* (Eudamus), = *Achalarus proximus*, *Leech*, 560.
- frigga, *Thunb.*, *Argynnis*, 225.
- frütlilum, *Hüb.*, = *Hesperia alveus*, *Hüb.*, var., 580.
- frivaldzskýi, *Led.*, *Satsuma* (*Thecla*), 352, 353, 354.
- fuliginosus, *Leech*, *Apostictopterus*, 631.
- fulva, *Fiss.*, = *Thecla prunoides*, *Staud.*, var., 363.
- fulva, *Leech*, *Apatura*, 158.
- fulvescens, *Alph.*, = *Pararge dumetorum*, *Oberth.*, var., 61.
- fulvof-nestrata, *Fiss.*, *Thecla prunoides*, *Staud.*, var., 363.
- fumida, *Bull.*, = *Argynnis daphne*, *Schiff.*, var., 229.
- fumosa, *Oberth.*, = *Aporia hippia*, var., 472.
- funebris, *Leech*, *Euripus*, 150, 655.
- fu-ca, *Brem.*, *Niphanda* (*Thecla*, *Amblypodia*), 340.
- fulca, *Leech*, = *Neope armandii*, *Oberth.*, var., 50.
- fylla, *Thunb.*, *Abisara* (*Taxila*), 296.
- gabrielis, *Leech*, = *Zephyrus* (*Thecla*) *michaelis*, *Oberth.*, var., 389.
- ganescha, *Koll.*, = (*Amathusia*) *Cyrestis thyodamas*, *Boisd.*, 248.
- ganymedes, *Leech* (nec *Westw.*), = *Charaxes rothschildi*, *Leech*, 128.
- ganymedes, *Westw.*, *Charaxes*, 128.
- Gareris**, *Moore*, = *Mycalosis*, 13.
- gasehkevitschii, *Feld.*, *Lasiommata*, 52.
- Gehlota**, *Doherty*, = *Celenorrhinus*, *Hüb.*, 509.
- gemina, *Leech*, *Lethe*, 39.
- gemmata, *Bull.*, *Argynnis*, 227.
- gemmata (-us), *Leech*, *Pamphila* (*Carterocephalus*), 588.
- gener, *Oberth.* (Eudamus), = *Achalarus simplex*, *Leech*, 561.
- generator, *Staud.*, = *Argynnis pales*, *Schiff.*, var., 224.
- genesia, *Moore*, *Aihopala* (*Amblypodia*), 343.
- genutia, *Boisd.*, *Anthocharis*, 478, 479.
- genutia, *Cram.*, *Danaus*, 6.
- germanus, *Oberth.*, *Achalarus* (Eudamus), 561.
- geticus, *Esp.*, = *Ceonympha oedipus*, *Fabr.*, 94.
- gidleneme, *Oberth.*, = *Nephtis arachne*, *Leech*, 191.
- gigantea, *Leech*, *Grapta*, 263.
- gigantea, *Leech*, *Leucophasia*, 484.
- glacialis, *Bull.*, = *Parnassius citrinarius*, *Motsch.*, 506.
- glauconia, *Motsch.*, = *Vanessa canace*, *Lin.*, var., 255, 256.
- gliceria, *Cram.*, = *Pieris canidia*, *Sparrrn.*, 455.
- glycyrrion, *Gray*, *Papilio*, 520.
- gola, *Moore*, *Padraona* (*Pamphila*), 598.
- gonata, *Moore*, *Ismene* (*Chorae*), 634.
- Gonepteryx**, *Leech*, 433.
- gong, *Oberth.*, *Argynnis*, 224.
- gopa, *Feld.*, *Mycalosis*, 14.
- gopala, *Moore*, *Papilio* (*Cadugoides*), 557.
- gopala, *Moore*, *Satarupa*, 563.
- goshkevitschii, *Mén.*, *Neope* (*Lasiommata*), 52.
- gotama, *Moore*, *Mycalosis*, 14.
- gota, *Mab.*, *Notoerypta* (*Plesioneura*), 628.
- goutellei, *Oberth.*, *Metaporja* (*Pieris*), 465.
- govindra, *Moore*, *Papilio* (*Cadugoides*), 557.
- gracilis, *Oberth.*, *Zophoessa* (*Pararge*), 42.
- grandis, *Feld.*, *Thecla*, 360.
- grandis, *Leech*, *Hidari* (*Plesioneura*), 633.
- Grapta**, *Kirby*, 262.
- greyi, *Brem.*, = *Sericinus telamon*, *Dou.*, var., ♀, 486.
- grouni, *Oberth.*, = *Parnassius orleans*, *Oberth.*, var., 504.
- gupta, de *Nicc.*, *Halpe*, 624.
- guttata (-us), *Brem.* & *Gray*, *Parnara* (Eudamus, *Goniloba*, *Pamphila*), 609.
- gyas, *Westw.*, *Papilio* (*Debasa*), 557.
- haematostictus, *Bull.*, = *Papilio alcinous*, *Klug*, var., 541.
- hainaus, *Moore*, *Gegenes*, 610.
- halimede, *Mén.*, *Melanargia* (*Argo*), 59.
- halisca, *Oberth.* (*Pieris*), = *Aporia procris*, *Leech*, 469.
- Halpe**, *Moore*, 621.
- hamada, *Drac.*, *Taraka* (*Miletus*), 298, 311.
- hamata, *Bull.* (nec *McLeay*), = *Tiramala septentrionis*, *Bull.*, 3, 4.
- hamigera, *Bull.*, = *Grapta e-album*, *Liun.*, var., 263, 264.
- hapalina, *Bull.*, = *Catochrysops cnejus*, *Fabr.*, 337.
- hara, *Moore* (*Precis*), = *Pseudergolis wedah*, *Koll.*, 275.
- Hasora**, *Moore*, 637.
- hastata, *Oberth.*, *Metaporja* (*Pieris*), 462, 465.
- hebe, *Leech*, *Euthalia*, 139.
- hecabe, *Liun.*, *Troias*, 428.
- hecabe, *Leech*, *Zephyrus*, 379.
- hecate, *Leech*, *Lethe*, 27.
- Helcyra**, *Feld.*, 152.
- helenia, *Leech*, *Lethe*, 26.
- helenus, *Liun.*, *Papilio* (*Charus*), 548.
- helle, *Chrysophanus*, 403.
- helle, *Leech*, *Zophoessa*, 44, 45.
- hellotia, *Mén.* (*Lycæna*), = *Everes argiades*, *Fall.*, 328.
- helmanni, *Led.*, *Liunentis*, 184.
- hemina, *Hew.*, *Helcyra*, 152.
- Heodes** (part.), *Dalm.*, = *Chrysophanus*, *Hüb.*, 396.

- herculea, *Bull.* (Pamphila), = *Agadiades sylvanus*, var., 601.
- hercules, *Blanch.*, = *Papilio gyas*, *Westw.*, var., 536.
- here, *Fehl.*, *Apatura*, 163.
- hero, *Linn.*, *Ceromyztha*, 95.
- herse, *Gr.-Gr.*, *Erebia*, 99.
- herzi, *Fers.*, *Thecla*, 367, 368.
- hesione, *Leech*, *Neptis*, 194.
- Hesperia**, *Falr.*, 575.
- Hestina**, *Westw.*, 149.
- hetacrus, *Mab.*, *Pamphila*, 507.
- Heteropterus**, *Dum.*, 583.
- Hidari**, *Dist.*, 633.
- hierta, *Fabr.*, *Junonia*, 282.
- hilla, *Westw.*, *Neorina*, 17.
- himalayensis, *Elwes*, = *Parnassius jacquemonti*, *Boisd.*, 435, 498.
- hindia, *Bull.*, = *Charaxes polyxena*, *Cram.*, var., 125.
- Hipio**, *Hüb.*, = *Melanitis*, *Fabr.*, 105.
- hippia, *Brem.*, *Aporia* (*Pieris*, *Leucon*), 471.
- hippoclus, *Cram.*, *Symbrenthia*, 284.
- hippocrates, *Feld.*, = *Papilio machaon*, *Linn.*, var., 516.
- hipponomes, *Herr.-Schaff.* (*Argynnis* ?), = *Dichorragia nesimachus*, *Boisd.*, 132.
- hippotoë, *Chrysophanus* (*Polymnatus*), 398.
- homeri, *Tameré*, *Limenitis*, 182.
- horatius, *Blanch.*, = *Papilio epycides*, *How.*, var., 556.
- horstfieldii, *Gray.*, = *Delias belladonna*, *Fabr.*, var., 418.
- houangty, *Oberth.*, *Pamphila* (*Carterocephalus*), 586.
- howqua, *Westw.*, *Stichophthalma* (*Thaumatant*), 113.
- huzza, *Gr.-Gr.*, = *Parnassius delphinus*, *Everson*, var., 504.
- hyale, *Linn.*, *Colias*, 431.
- hybrida, *Bull.*, = *Terias hecabe*, *Linn.*, var., 429.
- hydaspes, *Moore*, = *Limenitis triveni*, *Moore*, var., 187.
- hylas, *Wien. Verz.*, = *Lycæna baton*, *Eerg.*, 310.
- hylas, *Esper.*, *Lycæna*, 307.
- hyperanthus, *Linn.*, *Epinephelo*, 79.
- Hypolimnas**, *Hüb.*, 128.
- hypselis, *Godart*, *Symbrenthia*, 285.
- ibara, *Bull.*, *Zephyrus* (*Thecla*), 390.
- iburiensis, *Bull.*, *Lycæna*, 303.
- icana, *Moore*, *Zephyrus* (*Dipsas*), 380.
- icarus, *Westw.*, = *Papilio rhetenor*, *Westw.*, ♀, 549.
- icarus, *Rott.*, *Lycæna*, 306.
- iccius, *How.*, *Bicyclus*, 10.
- iccius, *How.*, *Camena* (*Iobus*), 350.
- ichtographia, *Bull.*, = *Rapala arata*, *Brem.*, 416.
- idas, *Linn.*, = *Lycæna argus*, *Linn.*, ♀, 302.
- Ilerda**, *Doubl.*, 104.
- ilia, *Wien. Verz.*, *Apatura*, 161.
- Iliades**, *Hüb.*, = *Papilio*, 544.
- ilicis, *Thecla*, 363.
- iliensis, *Gr.-Gr.*, = *Thecla* (*Lycæna*) *tengstromi*, *Ersch.*, var., 369.
- immacula, *Leech*, = *Leucophasia gigantea*, *Leech*, var., 484.
- imperator, *Oberth.*, *Parnassius*, 505.
- imperialis, *Hope*, *Teinopalpus*, 510.
- inachis, *Boisd.*, *Kallima*, 122.
- inachus, *Mén.*, *Aeromachus* (*Pyrgus*), 619.
- inconstans, *Bull.*, = *Argynnis niphæ*, *Linn.*, var., 244.
- indica, *Herbst*, *Pyrameis* (*Vanessa*), 252.
- indistans, *Moore*, *Mycalesis*, 13.
- indrani, *Moore*, *Coladenia*, 567.
- infernalis, *Standl.*, = *Parnassius delphinus*, var., 504.
- inflammata, *Alph.*, *Thecla*, 365.
- ino, *Rott.*, *Argynnis*, 230.
- insolita, *Leech*, *Ypthima*, 86.
- insularis, *Leech*, = *Lycæna argus*, *Linn.*, var., 302.
- intensa, *Bull.*, *Pithecopis*, 393.
- intermedia, *Feld.*, = *Pieris iphita*, *Cram.*, 276.
- intermedia, *Leech*, = *Hestina subviridis*, *Leech*, var., 145.
- intermedia, *Pryer*, = *Neptis aceris*, *Lep.*, var., 203.
- interposita, *Standl.*, = *Grapta e-album*, *Linn.*, var., 265.
- io, *Linn.*, *Vanessa*, 255.
- iolo, *Leech*, = *Gneis pumilus*, *Fehl.*, var., 75.
- ion, *Leech*, *Everes* (*Lycæna*), 331.
- Iphicledes**, *Hüb.*, = *Papilio*, 519.
- iphita, *Cram.*, *Pieris* (*Junonia*), 276.
- irava, *Moore*, *Hidari*, 633.
- iris, *Leech*, *Ypthima*, 84.
- iris, *Linn.*, *Apatura*, 160.
- irrubescens, *Grose Smith*, *Euthalia*, 654.
- iscea, *Gray.*, = *Argynnis latonia*, *Linn.*, var., 227, 228.
- ismene, *Cram.*, = *Melanitis leda*, *Linn.*, var., 106.
- Ismene**, *Saranson*, 633.
- Isodema**, *Fehl.*, 116.
- Isoteinon**, *Feld.*, 582.
- ithiela, *Bull.*, *Delias* (*Thyca*), 419.
- jacintha, *Dewry*, = *Hypolimnas bolina*, *Linn.*, 130.
- jacquemonti, *Boisd.*, *Parnassius*, 495.
- jacquemonti, *Boisd.*, ♀, *Elwes*, = *Parnassius epaphus*, *Oberth.*, 492.
- jacquemontii, *Blanch.*, = *Parnassius epaphus*, *Oberth.*, 492.
- jägeri, *Mén.*, = *Terias beta*, *Boisd.*, 425.
- jalandra, *de Nicé.*, *Zophoessa*, 12.
- jalandr, *Bull.*, = *Charaxes polyxena*, *Cram.*, var., 125.

- Jamides**, *Hüb.*, 333.
janardana, *Moore*, Mycalesis, 11.
jankowskii, *Oberth.*, = *Ismene aquilina*, 635.
jansonis, *Butl.*, *Parnara* (*Pamphila*), 612.
japetus, *Cram.*, *Tagiades*, 573.
japonica, *Butl.*, = *Papilio bianor*, *Cram.*, var., 528.
japonica, *Feld.*, *Ilestina* (*Euripus*), 146.
japonica, *Leech*, *Luehdorfia*, 490.
japonica, *Mab.* (*Pamphila*)?, = *Padraona dara*, var., 507.
japonica, *Mén.*, = *Argynnis laodice*, var., 236.
japonica, *Mén.*, = *Limenitis sydyi*, *Led.*, var. ? *sibylla*.
Linn., var., 181, 186.
japonica, *Murray*, *Arhopala* (*Amblypodia*), 344.
japonica, *Murray* (*Dipsas*, *Thecla*), = *Zephyrus taxila*.
Brem., var., 370, 377.
japonica, *Murray* (*Lycæna*), = *Zizera maha*, *Koll.*, var., 325.
japonica, *Murray*, = *Rhopalocampa benjamini*, var., 641.
jasius, *Linn.*, *Charaxes*, 124.
jezabel, *Oberth.*, *Melitea*, 217.
jhora, *de Nicèr.*, *Aeromachus* (*Thanaos*), 620.
jina, *Moore*, *Athyma*, 172.
jonasi, *Jans.*, *Zephyrus* (*Thecla*, *Dipsas*), 385.
jugurtha, *Cram.*, = *Catopsilia crocale*, *Cram.*, 424.
Junonia, *Hüb.*, 278.
kala, *de Nicèr.*, *Evers.*, 332.
kali, *de Nicèr.*, *Aeromachus* (*Thanaos*), 618.
kalinda, *Moore*, *Erebia*, 99.
Kallima, *Westw.*, 121.
kalora, *Moore* (*Pieris*), = *Synchlœ callidice*, var., 459.
kardama, *Moore*, *Euthalia* (*Adolias*), 136.
kaschmirensis, *Koll.*, = *Vanessa urticae*, *Linn.*, var., 258.
katura, *Hew.* (*Dipsas*), = *Zephyrus ataxus*, *Hew.*, ♀, 374, 375.
kazamoto, *Druce*, = *Lycæna euphemus*, *Hüb.*, var., 313, 314.
khasiana, *Moore*, = *Neope armandii*, *Oberth.*, 50.
kœmpferi, *de l'Orza* (*Limenitis*), = *Neptis alvina*, *Brem.*, 201.
korana, *Fiers.*, = *Sericinus telamon*, *Don.*, var., 487.
kreitneri, *Fric.*, = *Aporia martineti*, *Oberth.*, var., 470.
krishna, *Moore*, *Papilio*, 534.
kumara, *de Nicèr.*, *Halpe*, 625.
labyrinthea, *Leech*, *Lethe*, 35.
ladakensis, *Feld.*, *Colias*, 436.
ladakensis, *Moore*, = *Papilio machaon*, *Linn.*, var., 517.
ladakensis, *Moore*, ? = *Vanessa urticae*, *Linn.*, var., 259.
leta, *Boisd.*, *Terias*, 425.
lais, *Leech*, *Thecla*, 303.
l-album, *Esper.*, = *Vanessa vau-album*, *Wien. Verz.*, 261.
lama, *Alph.*, = (*Eneis pumilus*, *Feld.*, var. *pakearcticus*, *Staud.*, 75.
lama, *Leech*, *Polycæna*, 294.
lama, *Oberth.*, = *Papilio philoxenus*, *Gray*, var., 538.
lamprospilus, *Feld.*, *Isoteinon* (*Pamphila*), 582.
lanaris, *Butl.*, *Lethe*, 25.
lanty, *Oberth.*, *Lycæna*, 310.
laodamia, *Leech*, *Lethe*, 30.
laodice, *Pall.*, *Argynnis*, 236.
Laogona, *Boisd.*, = *Symbrenthia*, *Hüb.*, 283.
laomedon, *Jones*, *Fabr.*, = *Papilio protenor*, *Cram.*, 545.
lapponica, = *Argynnis pales*, *Schiff.*, var., 224.
lara, *Leech*, = *Ismene gomata*, *Moore*, var., 635.
largeteau, *Oberth.*, *Metaporia* (*Pieris*), 461.
larraldei, *Oberth.*, *Metaporia* (*Pieris*), 464.
lasurea, *Græser.*, = *Niphanda fusca*, *Brem.*, var., 340, 341.
latefascia, *Fiers.*, = *Melitea parthenie*, *Bork.*, var., 213, 214.
latefasciata, *Mén.*, = *Limenitis sydyi*, *Led.*, var., 181.
latifasciata, *Leech*, *Ragadia*, 92.
latior, *Fiers.*, = *Thecla spini*, var., 357.
lativitta, *Leech*, = *Aulocera magica*, *Oberth.*, var., 73.
lativitta, *Leech*, = *Delias patna*, *Leech*, var., 422.
lato, *Gr.-Gr.*, = *Erynnis comma*, var., 595.
latonia, *Gr.-Gr.*, = *Melitea didyma*, *Esp.*, var., 211.
latonia, *Linn.*, *Argynnis*, 227.
latris, *Leech*, *Halpe*, 623.
laverna, *Leech*, *Apatura*, 164.
leda, *Leech*, *Melanargia*, 60.
leda, *Linn.*, *Melanitis*, 106, 652.
leechi, *de Nicèr.*, *Satsuma* (*Thecla*), 657.
lehana, *Moore*, = *Lycæna phæretes*, *Hüb.*, var., 306.
leonina, *Butl.*, *Adopæa* (*Pamphila*, *Heperia*, *Thymelicus*), 592.
leopardina, *Lucas* (*Argynnis*), = *Timelæa maculata*.
Brem. & Grey, 245.
lepechini, *Ersch.*, = *Limenitis trivena*, *Moore*, var., 187.
lepita, *Moore*, *Lilythea*, 288.
Leptocircus, *Suaïson*, 507.
Lethe, *Hüb.*, 18.
leucodice, *Eversm.*, *Pieris*, 470.
Leucophasia, *Steph.*, 480.
leucothœ, *Cram.* (nœ *Linn.*), = *Neptis eurynome*,
Westw., 202.
levana, *Linn.*, *Araschnia* (*Vanessa*), 268.

- levana, *Pryer* (nec *Lin.*), = *Araschnia fallax*, *Jaus.*, 272.
- levanoides, *Blanch.*, = *Araschnia prorsoides*, *Blanch.*, var., 273.
- lhamo, *Oberth.*, *Aporia* (*Pieris*), 658.
- lhatso, *Oberth.*, *Calinaga*, 652.
- li, *Oberth.*, *Chrysophanus*, 402.
- libitina, *Leech.*, = *Zophoessa dura*, *Marsh.*, var., 47.
- Libythea**, *Fabr.*, 286.
- ligyes, *Hec.*, = *Limenitis trivena*, *Moore*, var., 187.
- liliana, *Atkinson*, *Loboela*, 559.
- lipitana, *Stand.*, = *Limenitis populi*, *Lin.*, var., 188.
- Limenitis**, *Fabr.*, 176.
- limenitoides, *Oberth.*, *Vanessa*, 254.
- Limnas**, *Moore*, 5.
- limniace, *Bull.* (nec *Cram.*), = *Tirumala septentrionis*, *Bull.*, 3.
- limniace, *Cram.*, *Tirumala* (*Danaüs*), 4.
- linnaei, *Moore*, *Trepischrois*, 7.
- lisandra, *Cram.*, *Ypthima*, 90.
- livida, *Leech.*, = *Limenitis ciocolatina*, *Ponj.*, 186.
- Lobocla**, *Moore*, = *Achalarus*, *Scudder*, 559.
- locuples, *Bull.*, = *Argynnis adippe*, *Lin.*, var., 232, 233.
- loha, *Doherty*, *Aulocera* (*Satyrus*), 71.
- lohita, *Horsf.*, = *Symbrenthia hippoclus*, *Cram.*, 410.
- longinus, *Hec.*, *Iolaus*, 412.
- loomisi, *Pryer* (*Amblypodia*), = *Arhopala ganesa*, *Moore*, var., 343.
- lotis, *Leech.*, *Metaporja* (*Pieris*), 463.
- lua, *Gr.-Gr.*, *Polycæna*, 294.
- lucasi, *Mab.*, *Halpe* (*Hesperilla*), 624.
- lucifera, *Leech.*, *Celenorrhinus*, 571.
- lucilla, *Hüb.*, *Neptis*, 206.
- lucina, *Cram.*, = *Symbrenthia hippoclus*, *Cram.*, 284.
- luculentus, *Leech.*, *Tajuria* (*Iolaus*), 412.
- ludmilla, *Herr.-Schäff.*, = *Neptis lucilla*, *Hüb.*, var., 206, 207.
- Luehdorfia**, *Crüger*, 490.
- lugens, *Honrath*, = *Melanargia halimede*, *Feld.*, var., 59, 60.
- lunata, *Leech.*, *Enispe*, 111.
- lunigera, *Bull.*, = *Grapta e-album*, *Lin.*, var., 263, 265.
- lunulata, *Ersch.*, *Thecla*, 368.
- lutea, *Hee.*, *Zephyrus* (*Dipsas*), 386.
- luteofasciata, *Ponj.*, *Zophoessa* (*Debis*), 46.
- Lycæna**, *Fabr.* (part.), 299.
- lycidus, *Smith-Abb.*, *Achalarus*, 559.
- lycorinus, *Bull.*, *Lycæna* (*Polyommatus*), 311.
- lyde, *Leech* (*Taractroera*), = *Aeromachus delai-lama*, *Mab.*, 620.
- lysimon, *Hüb.*, *Zizera* (*Lycæna*), 324.
- lysippe, *Jaus.*, = *Argynnis ruslana*, *Motsch.*, 237.
- maacki, *Mén.*, *Papilio*, 529.
- maackii, *Brem.* (*Lasiommata*), = *Lethe marginalis*, *Motsch.*, 25.
- machanon, *Lin.*, *Papilio*, 516.
- macilentus, *Jaus.*, *Papilio*, 547.
- mackinnonii, *de Nicée*, *Argynnis*, 227.
- maculata, *Brem.*, *Timelea* (*Melitæa*, *Argynnis*), 245.
- maculata (-us), *Brem.* & *Grey*, *Hesperia* (*Syrichthus*, *Pyrgus*), 576.
- maculosa, *Feld.*, *Celenorrhinus* (*Pterygospidea*), 539.
- maculosa, *Leech.*, = *Dudona eugenes*, *Bates*, var., 292.
- maculosa, *Leech.*, *Epinephele*, 78.
- madrensis, *Feld.*, = *Gonepteryx rhauni*, *Lin.*, var., 441.
- mæra, *Lin.*, *Ameccera*, 67.
- mæsa, *Moore*, *Padraona*, 595.
- mævius, *Fabr.*, *Taractroera* (*Hesperia*), 589.
- maga, *Leech.*, *Padraona* (*Pamphila*), 599.
- magica, *Oberth.*, *Aulocera* (*Satyrus*), 73.
- magna, *Leech.*, *Mycælesis perdicæ*, var., 14.
- maha, *Köll.*, *Zizera* (*Lycæna*), 325.
- Mahathala**, *Moore*, 344, 347.
- mahendra, *Moore*, *Neptis*, 201.
- mahesa, *Moore*, *Athyma*, 168.
- majuscula, *Leech.*, *Ameccera*, 67.
- malvae, *Lin.*, *Hesperia*, 575.
- mandarina, *de l'Orca*, = *Terias hecabe*, *Lin.*, 429.
- mandarina, *Leech.*, = *Pieris melete*, *Mén.*, var., 451.
- Mandarinia**, *Leech*, 9.
- mandarinus, *Oberth.*, *Papilio*, 520.
- mandarinus, *Feld.*, = *Charaxes narceus*, *Hec.*, var., 126.
- mandschuricæ, *Oberth.*, = *Parnassius nomion*, *Fisch.*, var., 499.
- mandschurica, *Speyer*, = *Pieris rapæ*, *Lin.*, var., 457.
- mandschurica, *Stand.*, = *Lycæna chinensis*, *Murray*, 315.
- mandschurica, *Fies.*, = *Melitæa athalia*, *Rott.*, var., 215.
- manea, *Hee.*, *Rapala* (*Deudorix*), 414.
- mangala, *Moore* (*Pamphila*), = *Parnara guttatus*, *Brem.* & *Grey*, 609.
- manzorum, *Ponj.*, *Satyrus*, *Pararge*, 38.
- marginalis, *Motsch.*, *Lethe* (*Satyrus*), 25.
- marginata, *Ponj.* (*Lycæna*), = *Zizera maha*, *Köll.*, var., 325, 326.
- maria, *Semper*, *Papilio*, 539.
- marica, *Leech.*, = *Herda saphir*, *Blanch.*, var., 407.
- mariesi, *Bull.*, = *Papilio alebion*, *Gray*, var., 522.

- mariesii, *Butl.*, = *Terias hecabe*, *Linna.*, var., 429.
 martinetti, *Oberth.*, *Aporia* (*Pieris*), 470.
 martius, *Fabr.*, *Mycalesis*, 10.
 mathias, *Fabr.*, *Parnara* (*Ilesperia*, *Epargyreus*, *Pamphila*, *Chapra*, *Baoris*), 606.
 matuta, *Leech*, *Polycena*, 294.
 maxima, *Butl.*, = *Gonepteryx rhamnii*, *Linna.*, var., 440.
 medusa, *Leech*, = *Ypthima methorina*, *Oberth.*, var., 84.
 megalomma, *Butl.*, *Ypthima*, 86.
 meganera, *Butl.* (*Synchlœ*), = *Pieris melete*, *Mén.*, var., 449.
Melanargia, *Meigen*, 58.
 melaneus, *Cram.*, *Caduga* (*Danaïs*), 3, 142.
 melania, *Oberth.*, = *Metaporia larraldei*, *Oberth.*, var., 465.
 melanina, *Herr.-Schaff.*, = *Melitæa phœbe*, *Knoch.*, var., 214.
 melanina, *Mén.*, = *Melitæa phœbe*, *Knoch.*, var., 214.
Melanitis, *Fabr.*, 105.
 melete, *Mén.*, *Pieris*, 448.
Melitæa, *Fabr.*, 210.
 melpomene, *Leech*, *Zephyrus* (*Dipsas*), 386.
 mennon, *Linna.*, *Papilio* (*Iliades*), 544.
 mena, *Moore*, *Hestia*, 143.
 mencia, *Moore*, *Parnara* (*Pamphila*), 607.
 menicus, *Feld.*, = *Papilio alcinous*, *Klug.*, var., 540.
 menedemus, *Oberth.*, = *Charaxes narceus*, *Hev.*, var., 126.
Menelaides, *Moore*, = *Papilio*, 554.
 menetriesii, *Birn. & Grey* (*Satyrus*), = *Pararge deidamia*, *Eversm.*, 95.
 meia, *Jans.*, *Thecla*, 358, 367.
 meridionalis, *Feld.*, = *Melanargia halimede*, *Feld.*, var., 59.
 merlina, *Oberth.*, *Aulocera* (*Satyrus*), 72.
Metaporia, *Butl.*, 460.
 metea, *Scudl.*, *Erynnis* (*Ocytes*), 563.
 methorina, *Oberth.*, *Ypthima*, 83.
 metis, *Frey.*, = *Apatura ilia*, *Wien. Verz.*, var., 161.
 miala, *Moore*, *Neptis*, 198.
 micæus, *Brem.*, *Itapala* (*Thecla*), 414.
 michaelis, *Oberth.*, *Zephyrus* (*Thecla*), 388.
 micio, *Oberth.*, *Pamphila* (*Carterocephalus*), 589.
 micrargus, *Butl.*, = *Lycæna ægon*, *Schiff.*, var., 300, 301.
 midamus (part.), *Linna.* (*Euploea*), = *T. linnaei*, 7.
 midas, *Butl.*, = *Argynnis amadyomene*, *Feld.*, 240.
 milado, *Leech*, *Papilio*, 523.
 mikado, *Pogonst.*, = *Papilio machaon*, var., 516.
 mineva, *Leech*, *Zephyrus* (*Dipsas*), 387.
 mineus, *Linna.*, *Mycalesis*, 12.
 minima, *Fuess*, *Zizera* (*Lycæna*), 323.
 minos, *Oberth.* (*Papilio*), = *Ornithoptera rhadamanthus*, *Boisd.*, 513.
 mirus, *Feld.*, *Abrota*, 167.
 misenus, de *Nicœ.*, *Mycalesis*, 15.
 missippus, *Linna.*, *Hypolimnas*, 178.
 mongolica, *Oberth.*, (*Eneis* (*Chionobas*), 76.
 montana, *Leech*, = *Melanargia halimede*, *Feld.*, var., 59, 60.
 montanus, *Brem.*, *Thanaos* (*Pyrgus*, *Nisoniades*), 580.
 mntela, *Gray*, = *Sericinus telamon*, *Don.*, var., ♂, 485.
 montium, *Oberth.*, *Colias*, 436.
 moolata, *Moore*, *Parnara*, 613.
 moorei, *Hev.*, *Ilerda*, 407.
 moorei, *Leech*, *Lycæna*, 310.
 moori, *Mab.* (*Pterygospidea*), = *Daimio sinica*, *Feld.*, 565.
 morgiana, *Westw.*, *Dilipa* (*Apatura*), 106.
 morpheus, *Pall.*, *Heteropterus* (*Cyclopides*), 583.
 morsei, *Fenton* (*Leptosis*), = *Leucophasia sinapis*, *Linna.*, var., 483.
 motschulskiji, *Mén.*, *Ypthima* (*Satyrus*), 88.
 motschulskyi, *Brem. & Grey*, *Ypthima* (*Satyrus*), 88, 646.
 moupinensis, *Pouj.* (*Debis*), = *Zophoessa dura*, *Marsh.*, var., 47.
 mairheadii, *Feld.*, *Neope* (*Lasiommata*, *Debis*), 54.
 multiformis, *Pyger*, = *Terias hecabe*, *Linna.*, 428.
 multistriata, *Butl.*, *Ypthima*, 649.
 murdava, *Dist.*, = *Pitheauria stramineipennis*, ♀, 631.
Mycalesis, *Hübner*, 10.
 myrmidone, *Esper*, *Colias*, 438.
 myrrha, *Godart*, *Lilythæa*, 287.
 naia, *Leech*, = *Lethe satyrina*, *Butl.*, 29.
 nama, *Doob.*, *Hestia* (*Diadema*), 142.
 namanganus, *Staud.*, = *Parnassius delphius*, var., 504.
 nana, *Leech*, *Timele*, 246.
 nardina, *Moore*, *Neptis*, 204, 205.
 nanna, *Mén.*, *Eneis*, 76.
 nanus, *Leech*, *Aeromachus* (*Cyclopides*), 620.
 napi, *Linna.*, *Pieris*, 447.
 nara, *Moore*, *Euthalia* (*Adolias*), 138.
 narada, *Moore*, *Daimio* (*Satarupa*), 563.
Narathura, *Moore*, = *Arhopala*, *Boisd.*, 342.
 narceus, *Hev.*, *Charaxes*, 126.
 narsens, *Leech*, *Parnara*, 614.
 nemorum, *Oberth.*, = *Pararge dumetorum*, *Oberth.*, var., 61.
Neope, *Butl.*, 48.
Neorina, *Westw.*, 16.

- nepalensis, *Gray*, Gonepteryx, 440.
 nephele, *Leech*, Halp., 622.
 nepos, *Oberth.*, Achalarus (Eulamus), 561.
Neptis, *Fabr.*, 189.
 nerine, *Fisch.*, *Motsch.*, = *Colias hyale*, *Linna.*, 431.
 nerippe, *Feld.*, *Argynnis*, 234.
 nervulata, *Mab.*, *Adopaea* (Pamphila), 592.
 nesimachus, *Boisd.*, *Dichorragia*, 132.
 nessens, *Grose Smith*, *Dichorragia*, 653.
 neumogeni, *Leech*, *Stichophthalmia*, 114.
 nevilli, *Wood-Mason*, *Papilio* (Panosmia), 543.
 niconicolens, *Bott.*, = *Papilio helenus*, *Linna.*, 548.
 nicea, *Gray*, *Stibochiona* (Adolias), 133.
 nicetas, *Hev.*, *Lethe* (Debis), 40, 44.
 nicévillei, *Leech*, *Satsuna*, 355, ? = *S. leechi*, de *Nicér.*, 657.
 nigrescens, *Leech*, = *Thanaos montanus*, *Brem.*, var., 581.
 nigricans, de *Nicér.*, *Notocrypta* (Plesioneura), 628.
 nigricans, *Leech*, *Zephyrus celestis*, *Leech*, var., 383.
 nigrifascia, *Leech*, *Lethe*, 33.
 nigrivena, *Leech*, = *Hestina mena*, *Moore*, var., 143.
 nigrolimbatus, *Saell.*, *Taractroera*, 530.
 nilgherriensis, *Guér.*, = *Lethe europa*, var., 21.
 ningpoana, *Feld.*, = *Athya sulphitia*, *Cram.*, var., 174.
 niobe, *Linna.*, *Argynnis*, 235.
Niphanda, *Moore*, 340.
 niphæ, *Linna.*, *Argynnis*, 243.
 niphona, *Bull.*, = *Melitæa athalia*, *Rott.*, var., 215.
 niphonica, *Bull.*, = *Neope goschkevitschii*, *Mén.*, 52.
 niphonica, *Jans.*, = *Erebia sedakovii*, var., 98, 99.
 nissa, *Koll.*, *Rapala* (Deudorix), 413.
 niveomaculata (-us), *Oberth.*, *Pamphila* (Carterocephalus), 587, 588.
 nixa, *Gr.-Gr.*, = *Vanessa urticae*, *Linna.*, var., 260.
 nomion, *Fisch.*, *Parnassius*, 498.
Notocrypta, de *Nicér.*, 626.
 nubilis, *Mab.* (Sterops), = *Asictopterus olivascens*, *Moore*, 630.
 nutans, *Oberth.*, = *Metaporia laraldei*, *Oberth.*, var., 465.
 nycteis, *Mén.*, *Apatura* (Athyma, Neptis), 155.
 nymphalis, *Speyer*, *Satarupa* (Tagiades), 562.
Nymphalis, *Westw.* (nec *Lutr.*), = *Charaxes*, *Ochs.*, 123.
 nymphidia, *Bull.*, *Stiboges*, 295.
 oberthüri, *Leech*, *Hesperia* (Syrichthus), 579.
 oberthüri, *Leech*, *Hestina*, 147.
 oberthüri, *Leech*, *Metaporia* (Pieris), 462.
 oberthüri, *Leech*, *Neope*, 51.
 oberthüri, *Stand.* (Thecla), = *Zephyrus butleri*, *Fenton*, 393.
 obscura, *Elwes & Edwards*, *Ypthima*, 647.
 obscura, *Fenton*, = *Araschnia levana*, *Linna.*, var., 269.
 occidentalis, *Leech*, = *Adopaea sylvatica*, *Brem.*, var., 591.
 occidentalis, *Leech*, = *Callarge sagitta*, *Leech*, var., 58.
 occulta, *Leech*, = *Lethe oculatissima*, *Ponj.*, var., 27.
 occia, *Hev.*, *Baoris* (Hesperia), 616.
 ocellatus, *Bull.* (Satyrus), = *Epinephele hyperanthus*, *Linna.*, var., 79.
 ochracea, *Brem.*, *Augiades* (Pamphila), 605.
 oculata, *Moore*, *Mycalesis*, 14.
 oculatissima, *Ponj.*, *Lethe* (Mycalesis), 27.
 ocyale, *Hübner*, = *Junonia orithyia*, *Linna.*, var., 280.
Ocytes, *Seudd.*, = *Erymnis*, *Schrank*, 593.
 oda, *Hev.*, *Herda*, 407.
 odata, *Hev.*, *Chaetoprocta* (Dipsas), 367.
 oedipus, *Fabr.*, *Cetonyompha*, 94.
Oeneis, *Hübner*, 74.
 œnone, *Cram.*, = *Junonia hierta*, *Fabr.*, 282.
 œnone, *Leech*, *Thecla*, 366.
 olivascens, *Moore*, *Asictopterus*, 629.
 omeia, *Leech*, *Celanorhinus*, 572.
 omeia, *Leech*, *Euthalia*, 139.
 opalina, *Bull.*, *Palaeonympha*, 81.
 opalina, *Koll.*, *Athyma* (Limenitis), 170.
 opalina, *Ponj.* (Lycæna), = *Zizera maha*, *Koll.*, var., 325, 326.
 ops, *Gr.-Gr.* (Carterocephalus), = *Pamphila pulchra*, *Leech*, 586.
 optilete, *Knock*, *Lycæna*, 304.
 orcas, *Drury*, *Aphneus*, 469.
 ordossi, *Alph.*, = *Cetonyompha amaryllis*, *Cram.*, var., 96.
 oreas, *Leech*, = *Araschnia davidis*, *Ponj.*, var., 275.
 orientalis, *Brem.*, ? = *Synchlœo daphnice*, var., 459.
 orientalis, *Elwes*, = *Athyma opalina*, *Koll.*, var., 170, 171.
 orientalis, *Mén.*, = *Melitæa parthenie*, *Bork.*, var., 213.
 orientalis, *Murray*, *Zephyrus* (Thecla), 376.
 orientalis, *Oberth.*, = *Pieris rapæ*, *Linna.*, var., 457.
 orientis, *Oberth.*, = *Pieris melete*, *Mén.*, var., 450.
Orinoma, 16.
 orion, *Pull.*, *Lycæna*, 309.
 orithyia, *Linna.*, *Junonia*, 279.
 orixa, *Moore*, *Callerebia*, 103.
 orleans, *Oberth.*, *Parnassius*, 502.
 ornata, *Leech*, *Thecla*, 363, 364.
 ornaticissima, *Leech*, *Argynnis*, 234.
 ornatus, *Brem.* (Cyclopiodes), = *Heteropterus unicolor*, *Brem. & Gray*, var., 584.

- Ornithoptera**, *Boisd.*, 512.
 orsedice, *Bull.*, Zephyrus (Thecla), 393.
Orthomiella, *de Nicée*, 338.
 oscarus, *Eversm.*, Argynnis, 222.
 ossianus, *Herbst*, Argynnis, 222.
 ouang, *Oberth.*, Chrysophanus, 401.
 ouida, *Moore*, Dodona, 292.
- padma, *Koll.*, Aulocera (Satyrus), 71.
Padraona, *Moore*, 595.
 palcarctica, *Staud.*, = Pieris canidia, var., 456.
 palcarcticus, *Staud.*, = Ecnis pumilus, *Feld.*, var., 75.
 palamon, *Pall.*, Pamphila (Carterocephalus), 585.
 palano, *Linna.*, Colias, 437.
Palaenymphia, *Bull.*, 80.
 palos, *Schiff.*, Argynnis, 224.
 pallas, *Leech*, Apatura, 157.
 pallus, *Butler*, = Colias hyale, *Linna.*, 431.
 pallescens, *Bull.*, = Argynnis adippe, *Linna.*, var., 232.
 233.
 pammon, *Linna.*, = Papilio polytes, *Linna.*, 552.
Pamphila, *Fabr.*, 585.
 pang, *Oberth.*, Chrysophanus, 403.
Paphia, *Boisd.*, 122.
 paphia, *Linna.*, Argynnis, 239.
 paphioides, *Bull.*, = Argynnis paphia, *Linna.*, var., 239.
 papbus, *de Nicée*, = Papilio mandarinus, *Oberth.*, var., 520.
Papilio, *Doubl.*, 513.
Paraplesia, *Feld.*, = Isodema, *Feld.*, 116.
Pararge, *Hüb.*, 61.
Parata, *Moore*, = Hasora, *Moore*, 637.
Pareba, *Doubl.*, = Acrea, 114.
 paris, *Linna.*, Papilio (Achillides), 535.
Parnara, *Moore*, 606.
Parnassius, *Latr.*, 491.
 parthenie, *Bork.*, Melitea, 213.
 parva, *Leech*, Mycalesis sangaiica, var., 12.
 patala, *Koll.*, = Catochrysox cnejus, *Fabr.*, 336.
 patala, *Koll.*, Euthalia (Adolias), 138.
 patria, *Leech*, Neorina, 17.
 patrius, *Leech*, Thecla, 359.
 patra, *Leech*, Delias, 422.
 paulina, *Nard.* (Damora), = Argynnis sugana, ♀, 241.
 paulina, *Cram.*, Tachyris, 475.
 paupera, *Alph.*, = Satyrus dryas, *Scop.*, var., 69, 70.
 pavonia, *Alph.*, = Coenonympha, 97, 450.
Pazala, *Moore*, = Papilio, 523.
 pedius, *Leech*, Zephyrus, 378.
 peguanus, *Moore*, Aphaeus, 411.
 pelias, *Leech*, Thannos (Nisoniades), 581.
Pelion, *Kirby*, = Adopaea, *Billb.*, 590.
 pellucida, *Murray*, Parnara (Pamphila, Thymelicus), 611.
 peloria, *Hew.*, Mesapia, 474, 659.
 penelope, *Staud.*, = Argynnis zenobia, *Leech*, 242.
 penicillata, *Pouj.*, = Mycalesis perdicca, 13.
Penthema, *Doubl.*, 116.
 penthesilea, *Fabr.*, = Cethosia biblis, *Drury*, 120.
 perconis, *Leech*, Thecla, 366.
 perdicca, *Hew.*, Mycalesis, 13.
 perfecta, *Leech*, = Ypthima motschulskyi, *Brem.* & *Greg.*, var., 88; bon. sp., 647.
 pero, *de Nicée*, Celenorrhinus, 570.
 perryi, *Bull.*, = Argynnis seleue, *Hüb.*, var., 222.
 perseis, *Led.*, = Coenonympha hero, *Linna.*, var., 95.
 persimilis, *Westw.*, Hestia, 146.
 phadra, *Leech*, = Apatura here, *Feld.*, var., 163.
 phadra, *Linna.*, = Satyrus dryas, *Scop.*, 69.
 phalanta, *Drury*, Atolla (Argynnis), 208.
 phaneus, *Hew.*, Casyapa, 572.
 phania, *Oberth.*, Epinephele, ? Ypthima, 89.
Phedra, *Horsf.*, = Curetis, *Hüb.*, 348.
 pheretes, *Hüb.*, Lycæna, 305.
 philomela, *Johannsen*, Ypthima, 90, 91.
 philoxenus, *Gray*, Papilio (Byasa), 537, 539, 542.
 philyroides, *Staud.*, Neptis, 200, 201.
 phineus, *Cram.*, 600.
 phreas, *Linna.*, Chrysophanus (Polyommatus), 369.
 phrebe, *Knoch*, Melitea, 214.
 phyllis, *Leech*, Calleebia, 101.
 phylloedri, *Staud.*, *MSS.*, = Thecla herzi, *Flix*, 367.
 piccus, *Leech*, Aeronachus, 618.
 pierioides, *Moore*, Calliana, 557, 660.
Pieris, *Boisd.*, 447.
Pisola, *Moore*, 559.
Pithauria, *Moore*, 631.
 plagifera, *de Nicée*, Celenorrhinus, 571.
 pleistoanax, *Feld.*, = Charaxes polyxena, *Cram.*, var., 126.
Plesioneura, *Feld.*, = Notocrypta, *de Nicée*, 626.
 pluscula, *Leech*, Celenorrhinus, 571.
 pluto, *Leech*, = Satsuma chalybeia, *Leech*, var., 355.
 plutonius, *Oberth.*, Papilio, 541.
 podalirius, *Oberth.*, = Papilio podalirius, *Linna.*, var., 519.
 podalirius, *Linna.*, Papilio (Iphicides), 519.
 poeta, *Oberth.*, = Parnassius epaphus, *Oberth.*, var., 493.
 polaris, *Staud.*, = Vanessa urtica, *Linna.*, var., 260.
 polidorus, *Cram.*, = Papilio aristolochie, *Fabr.*, 554.
 poliographus, *Motsch.*, = Colias hyale, *Linna.*, var., 422.
Polycæna, *Staud.*, 293.

- polyctor, *Boisd.*, Papilio, 529.
 polyctes, *Doubl.*, = Papilio philoxenus, *Gray*, var., 537.
Polyommatus, *Boisd.*, = Chrysophanus, *Habu.*, 396.
Polyommatus, *Latr.*, 337.
 polyphemus, *Oberth.* (Erebia), = Callerebia orixa, *Moore*, var., 103.
 polysperchon, *Bergst.* (Lycaena), = Everses argiades, *Pall.*, var., 329.
 polytes, *Lin.*, Papilio (Laertes), 552.
 polyxena, *Cram.*, Charaxes, 125.
 pontis, *Elces*, Orthomiella (Chilades?), 339.
 populi, *Lin.*, Limenitis, 187.
 porima, *Ochs.*, = Araschnia levana, *Lin.*, var., 269.
 poryria, *Hope*, = Teinopalpus imperialis, ♀, 510.
 posidonius, *Leech*, Charaxes, 127.
 potanini, *Alph.*, Aporia, 659.
 potanini, *Alph.*, Everses (Lycaena), 332.
 praenubila, *Leech*, Ypthima, 87.
 praesta, *Leech*, Pararge, 62.
Pratapa, *Moore*, = Camena, *Heic.*, 350.
 pratorum, *Oberth.*, Callerebia, 101, 102.
 pratti, *Elces & Edw.*, Ypthima, 645.
 pratti, *Leech*, Abrota, 167.
 pratti, *Leech*, Euthalia, 138.
 pratti, *Leech*, Limenitis, 187.
 pratti, *Leech*, Satsuma, 352, 354.
 pratti, *Leech* (Thecla), = Sinthusa chandrarā, *Moore*, 395.
Precis, *Habu.*, 276.
 princeps, *Fers.*, Sepsis (Apatura), 151.
 princeps, *Oberth.*, Polycena (Emesis), 293.
 privigna, *Leech*, = Lethé camilla, var., 32.
 proene, *Leech*, Zophoessa, 45.
 procris, *Leech*, Aporia, 469.
 procris, *Leech*, = Lethé baucis, var., 22.
 prominens, *Moore* (Chapra), = Parnara sinensis, *Moore*, 608.
Pronophila, 17.
 prorsa, *Lin.*, Araschnia (Vanessa) levana, *Lin.*, var., 269, 273.
 prorsoides, *Blanch.*, Araschnia, 273.
 pronotor, *Cram.*, Papilio (Sainia), 545.
 protomedia, *Mén.*, Melitaea, 216.
 proxima, *Leech*, Lethé, 32.
 proximus, *Leech*, Achalarus (Eudamus), 590.
 pruni, *Lin.*, Thecla, 361, 362.
 prunoides, *Staud.*, Thecla, 362, 363.
 prusias, *Feld.*, Padraona, 600.
 pryri, *Butl.*, Neptis, 206.
 pryri, *Jans.*, = Grapta (Vanessa) e-aureum, *Lin.*, var., 266.
 pryri, *Moore* (Athyma), = Limenitis helmanni, *Led.*, var., 184.
 pryri, *Murray*, Lycaena, 313.
 przewalskii, *Alph.*, Parnasius, 502, 504.
 pseudogon, *Butl.*, = Lycaena wgon, *Schiff.*, var., 300, 301.
Pseudergolis, *Feld.*, 275.
 pseudolonginus, *Doubl.*, Iolus, 333.
Pterygospidea, *Wallgr.*, = Tagiade, *Habu.*, 573.
 pulaha, *Moore*, Neope (Laiommata?), 52.
 pulchra, *Leech*, Pamphila, 586.
 pumilus, *Feld.*, (Encis (Chionobas), 75.
 punctata, *Leech*, Athyma, 176.
 puziloi, *Ersch.*, Luehdorfia, 491.
 puziloi, *Pryer*, = Luehdorfia japonica, *Leech*, 490, 491.
 pylaon, Lycaena, 315.
Pyrameis, *Habu.*, 249.
Pyrgus, *Habu.*, = Hesperia, *Fabr.*, 575.
 pyrha, *de Nicéa*, Celanorhinus, 572.
 pyrha, *Leech*, Euthalia, 137.
 querceti, *Moore* (Amblypodia), = Arhopala rama, *Koll.*, 344.
 quercivora, *Staud.*, Zephyrus (Thecla), 382.
 quercus, *Lin.*, Thecla, 370, 371, 382.
 quinquepuncta, *Mab.*, = Parnara pellucida, var., 611.
 rabdia, *Butl.*, = Argynnis daphne, *Schiff.*, var., 239.
 raddei, *Brem.*, = Papilio maacki, *Mén.*, var., 531.
Ragadia, *Westw.*, 92.
 rama, *Koll.*, Arhopala (Thecla, Amblypodia, Pamphala), 344.
 ramosa, *Leech*, Neope, 52.
 rape, *Lin.*, Pieris, 456.
Rapala, *Moore*, 413.
 raphaelis, *Oberth.*, Zephyrus (Thecla), 389.
 ravana, *Moore*, Papilio, 543.
 recurva, *Leech*, Athyma, 176, 656.
 regalis, *Leech*, Maudarinia (Mycalasis), 9.
 regia, *Butl.* (Thecla), = Zephyrus taxila, *Brem.*, var., 370.
 repercuta, *Leech*, Rapala, 414.
 repugnans, *Staud.*, = Erynnis comma, var., 591.
 restricta, *Leech*, = Papilio agestor, *Gray*, var., 557.
 restricta, *Moore*, Notocrypta (Plesioneura), 627.
 rhadamanthus, *Boisd.*, Ornithoptera (Papilio), 513.
 rhamni, *Lin.*, Gonomyrtex (Rhodocera), 439.
Rhaphicera, *Butl.*, 55.
 rhea, *Gr.-Gr.*, = Argynnis eugenia, *Eversm.*, var., 226.
 rhetenor, *Westw.*, Papilio (Panosmiopsis), 549.
Rhodocera, *Boisd.*, = Gonomyrtex, *Leech*, 439.
Rhopalocampa, *Wallengr.*, 640.

rikuchina, *Bull.* (Pamphila), = *Augiades ochracea*, *Brem.*, var., 605.
 rizana, *Moore*, = *Vanessa urticae*, *Linna.*, var., 250.
 rolria, *Fabr.*, *Lethe* (*Satyrus*), 22.
 romanovi, *Gr.-Gr.*, *Melitaea*, 211.
 romanovi, *Leech*, = *Neope bremeri*, *Feld.*, 51.
 romulus, *Cram.*, = *Papilio polytes*, *Linna.*, ♀, 552.
 rothschildi, *Leech*, *Charaxes*, 128.
 roxelana, *Cram.*, *Pararge*, 19.
 rubicundula, *Leech*, *Thecla*, 363.
 ruficola, *Leech*, *Erebia*, 109, 101.
 rufigena, *Leech*, *Erebia*, 101.
 ruslana, *Mutsch.*, *Argynnis*, 257.
 rusticanus, *Bull.*, = *Thamias montanus*, *Brem.*, 581.
 rutilus, *Wern.*, = *Chrysophanus dispar*, *How.*, var., 307.
Sadarga, *Moore*, = *Mycalesis*, 14.
 saepestriata, *Hev.*, *Zephyrus* (*Dipsas*), 384.
 sagerana, *Doubl.*, *Argynnis*, 241.
 sagitta, *Leech*, *Callarge*, 57.
 sahadava, *Moore*, *Euthalia* (*Adolias*), 136.
Sainia, *Moore*, = *Papilio*, 545.
 sakntala, *Köll.*, = *Argynnis childreni*, *Gray*, 243.
 sakra, *Moore*, *Ypthima*, 83.
Salatura, *Moore*, 5, 6.
Salpinx, *Haba.*, 8.
 sanaca, *Moore*, *Delias* (*Pieris*), 420.
 sanatana, *Moore*, *Mycalesis*, 14.
 sangaiica, *Bull.*, *Mycalesis*, 11.
 sangaiica, *Moore*, = *Neptis eurynome*, *Westw.*, var., 202, 203.
 sangra, *Moore*, *Zizera* (*Polyommatus*, *Lycena*), 323.
 saphir, *Blanch.*, *Iherla* (*Thecla*), 406.
 saphir, *Elytes* (nec *Blanch.*), = *Iherla moorei*, *Hev.*, 407.
 saphirina, *Staud.*, *Zephyrus* (*Thecla*), 378.
 sarala, *de Nicée*, *Parnara*, 615.
Sarbaria, *Moore*, = *Papilio*, 534.
 sarpedon, *Linna.*, *Papilio*, 524.
Satarupa, *Moore*, 562.
 satricus, *Doubl.*, *Rhaphicera* (*Lasiommata*), 55.
Satsuma, *Murray*, 352.
 satyrina, *Bull.*, *Lethe*, 23.
 satyrina, *Oberth.* (nec *Bull.*), = *Charaxes narceus*, *How.*, 126.
Satyrus, *Westw.*, 68.
 satyrus, *Edw.*, *Grapta* (*Vanessa*), 264.
 saxatilis, *Chr.*, var. *infernalis*, *Gr.-Gr.*, *Melitaea*, 211.
 saxicola, *Oberth.*, *Erebia*, 100.
 scayola, *Oberth.*, = *Papilio macilentus*, 547.
Scelothrix, *Ramb.*, = *Hesperia*, *Fabr.*, 575.

schakra, *Köll.*, *Ameceba*, 67.
 schrencki, *Men.*, *Apatura* (*Adolias*), 154.
 schrenckii, *Men.*, *Pronophila* ♀, 17.
 scintillans, *Leech*, *Zephyrus*, 376.
 sciron, *Leech*, = *Papilio gyas*, *Westw.*, var., 536.
 scolymus, *Bull.*, *Anthocharis*, 479.
 scoparia, *Bull.*, = *Erebia sedakovii*, *Eversm.*, var., 98, 99.
 scopulifera, *Moore*, *Baoris*, 617.
 scotosia, *Bull.*, = *Melitaea phoebe*, *Knoch*, var., 214.
 sculda, *Eversm.*, *Geneis*, 76.
 scylla, *Staud.*, = *Lycena lycornas*, *Bull.*, 311.
 s-brus, *Lycena*, 323.
 sedakovii, *Eversm.*, *Erebia* (*Hipparchia*), 98.
 segonacia, *Oberth.* (*Delis*), = *Neope muirheadii*, *Feld.*, var., 54.
 segonax, *Hev.* (*Delis*), = *Neope muirheadii*, *Feld.*, var., 54.
 selas, *Mib.* (Pamphila), = *Augiades sylvanus*, var., 601, 602.
 selene, *Haba.*, *Argynnis*, 222.
 semenovi, *Aph.*, *Ctenonympha*, 96.
 semifasciatus, *Marath.*, = *Papilio sarpedon*, var., 525.
 semizakra, *Leech* (*Amblypodia*), = *Arhopala gamsa*, *Moore*, var., 343.
Sephisa, *Moore*, 150.
 septentrionis, *Bull.*, *Tirimala* (*Danais*), 3.
 septentrionis, *Feld.*, *Ismene*, 636.
 seraphim, *Oberth.*, *Zephyrus* (*Thecla*), 386.
 serarum, *Oberth.*, = *Apatura hero*, *Feld.*, var., 163.
 serbonis, *Hev.*, *Lethe*, 29, 31.
 serica, *Leech*, = *Athyma mahesa*, var., 169.
 seica, *Leech*, = *Neope yama*, var., 49.
Sericinus, *Westw.*, 484.
 seriens, *Leech*, *Mycalesis niseus*, var., 15.
 serratalce, *Ramb.*, *Hesperia* (*Syrichthus*), 619.
 sibirica, *Staud.*, = *Ctenonympha hero*, *Linna.*, var., 95.
 sibirica, *Staud.*, = *Melitaea anruiua*, *Rott.*, var., 212.
 sibirica, *Staud.*, = *Satyrus antonoe*, *Eger*, var., 69.
 sibirica, *Staud.*, = *Satyrus dryas*, *Scop.*, var., 69, 70.
 sibylla, *Linna.*, *Limenitis*, 185.
 sicelides, *Goose Smith*, *Lethe*, 644.
 sicelis, *Hev.*, *Lethe* (*Delis*), 36.
 siderea, *Marsh.*, *Lethe*, 40.
 sidonis, *Hev.*, *Lethe*, 40.
 signata, *Bull.*, *Zephyrus* (*Thecla*), 381.
 sikkimensis, *Elwes*, = *Parnassius epaphus*, *Oberth.*, var., 492, 494.
 sikkimensis, *Moore*, = *Papilio machaon*, *Linna.*, var., 518.
 similis, *Leech*, *Augiades*, 605.

- s*-milis, *Leech* (Pamphila), = *Parnara sinensis*, *Mab.*, 608.
similis, *Moore* (Lyceana), = *Zizera maha*, *Koll.*, 327.
simoda, *de l'Orza*, = *Colias hyale*, *Lin.*, var., 432.
simplex, *Leech*, *Achalarus* (Eudanus), 561.
simulans, *Leech*, = *Lethe ocellata*, *Pouj.*, 34.
simulans, *Leech*, *Necope*, 49.
sinapis, *Lin.*, *Leucophasia*, 481.
sinensis, *Bull.* (Leptosia), = *Leucophasia sinapis*, *Lin.*, var., 482.
sineusis, *Elwes* (Chilades?), = *Orthomiella pontis*, *Elwes*, var., 339.
sinensis, *Lucas*, = *Terias hecabe*, *Lin.*, 428.
sinensis, *Mab.*, *Parnara* (Gegenes), 608.
sinensium, *Oberth.*, *Limenitis*, 179.
sinea, *Alph.*, *Comonympha*, 97, 651.
sinica, *Feld.*, *Daimio* (Pterygospidea), 565.
sinicus, *Bull.* (Pyrgus), = *Hesperia zona*, *Mab.*, 577.
sinina, *Gr.-Gr.*, = *Thanaos tages*, *Lin.*, var., 661.
Sinthusa, *Moore*, 391.
sipora, *Moore*, = *Argynnis pales*, *Schiff.*, var., 224.
sita, *Koll.*, = *Caluga tytia*, *Gray*, 2.
sitala, *de Nicée*, *Halpe*, 623.
smaragdina, *Brem.*, *Zephyrus* (Thecla), 371, 372.
soma, *Moore*, *Neptis*, 204.
soraeta, *Moore*, *Aporia*, 467, 470.
sordida, *Bull.* (Synchloë), = *Pieris canidia*, var., 455.
sordida, *Elwes & Edw.*, *Ypthima*, 648.
spathatus, *Bull.*, = *Papilio alcinous*, *Klug*, var., 540.
sphyrus, *Habu.*, = *Papilio machaon*, *Lin.*, var., 517.
Spindasis, *Wall.*, = *Aphneus*, *Habu.*, 409.
spini, *Wien. Verz.*, *Thecla*, 357.
standfussi, *Gr.-Gr.*, *Chrysophanus* (Polyommatus), 404.
staudingeri, *Baug-Haas*, = *Parnassius delphius*, var., 504.
staudingeri, *Leech*, = *Euthalia tibetana*, *Pouj.*, 138.
stellera, *Esch.*, *Ypthima*, 90.
Steropes, *Boisd.*, = *Pamphila*, *Fabr.*, 585.
steropes, *Wien. Verz.*, = *Heteropterus morphus*, *Pall.*, 583.
Stibochiona, *Bull.*, 133.
Stiboges, *Bull.*, 133.
Stichopphthalma, *Feld.*, 113.
stigmata, *Moore*, *Aeronaclius* (Thanaos), 618.
stoliczanus, *Feld.*, = *Parnassius delphius*, var., 504.
stramineipennis, *Wood-Mas. & de Nicée*, *Pithauria*, 631.
strephon, *Grose Smith*, *Euthalia*, 653.
striata, *Hev.*, *Ismene*, 636.
strigosa, *Bull.*, = *Araschnia burejana*, *Brem.*, 270, 271.
strigosa, *Alph.* (nec *Bull.*), = *Araschnia prorsoides*, *Blanch.*, var., 273.
strophia, *Godart* (Nymphalis), = *Athyma sulpitia*, var., 174.
stubbendorffii, *Mén.*, *Parnassius*, 506, 507.
styriana, *Bull.*, *Zephyrus* (Thecla), 391.
styrianus, *Bull.*, = *Chrysophanus phileas*, *Lin.*, var., 399, 400.
stygne, *Fisch.*, *Erebia*, 98.
stypax, *Oberth.* (Mycalasis), = *Lethe satyrina*, *Bull.*, 23.
suaveolens, *Wood-Mas. & de Nicée*, *Mycalasis*, 15.
subalba, *Pouj.*, *Apatura*, 158.
subaurata, *Bull.*, = *Colias hyale*, *Lin.*, var., 433.
subcerulea, *Leech*, *Apatura*, 156.
subferrens, *Bull.*, = *Terias leta*, *Boisd.*, var., 426.
sublava, *Leech*, *Halpe*, 625.
subhyalina, *Brem. & Grey*, *Augiades* (Hesperia), *Pamphila*, 602.
submacula, *Leech*, *Halpe*, 622.
subnubila, *Leech*, = *Colias sanaca*, *Moore*, var., 421.
subpurpurea, *Leech*, = *Halpa nissa*, *Koll.*, 413.
substituta, *Bull.*, = *Apatura ilia*, *Wien. Verz.*, var., 161.
subviridis, *Leech*, *Hestina*, 145.
suffusa, *Leech*, = *Stichopphthalma howqua*, *Westw.*, var., 114.
sulfusa, *Leech*, = *Zephyrus orientalis*, *Murray*, var., 377.
sulphurea, *Oberth.*, = *Aporia hippia*, var., 472.
sulpitia, *Crom.*, *Athyma*, 174.
sumitra, *Moore*, *Celaenorrhinus* (Gehlota, Plesioneura), 569, 570.
superba, *Leech*, *Helcyra*, 152.
sura, *Donbl.*, *Zophoessa*, 49.
susruta, *Moore*, *Neptis*, 204.
sujudana, *Moore*, = *Melanitis aswa*, *Moore*, var., 108.
swinhoei, *Bull.*, = *Junonia erithyia*, *Lin.*, var., 289.
syama, *Horsf.*, *Aphnaeus* (Amblypoda, Spindasi-), 410.
sybillina, *Oberth.*, *Anlocera* (Satyrus), 73.
sydyi, *Lea*, *Limenitis*, 181.
sydanius, *Oberth.*, *Papilio*, 532.
sylvanoides, *Leech*, *Augiades*, 604.
sylvanus, *Esp.*, *Augiades* (Hesperia), 601.
sylvatica, *Brem.*, *Adopca* (Pamphila), 591.
sylvicola, *Oberth.*, *Callerbia*, 163.
Symbrenthia, *Habu.*, 283.
Synchloë, *Habu.*, 458.
syreis, *Hev.*, *Lethe*, 37.
Syrictus, *Boisd.*, = *Hesperia*, *Fabr.*, 575.

- syrichtus, *Fabr.* (Pyrgus), *Hesperia*, 575.
 széchenyi, *Fric.*, *Parnassius*, 501.
- Tachyris**, *Wall.*, 474.
 tagos, *Liun.*, *Thanaos* (*Nisoniades*), 580, 581, 661.
- Tagiades**, *Hübner*, 573.
- Tajuria**, *Moore*, 412.
- tamerlana, *Stand.*, *Polycæna*, 294.
 tamerlanus, *Oberth.*, *Papilio*, 521.
- tamu, *Hew.* (nec *Koll.*), = *Ilerda viridipunctata*, *de Nicèr.*, 405.
- tamu, *Koll.*, *Ilerda*, 406.
- tangutica, *Gr.-Gr.*, = *Thecla tengstroemi*, *Ersch.*, var., 369.
- Tansima**, *Moore*, = *Lethe*, 23.
- Taractroera**, *Bull.*, 589.
- Taraka**, *Doherty*, 297.
- taxila, *Brem.*, *Zephyrus* (*Thecla*), 370.
- teesta, *de Nicèr.* (*Satadra*), = *Arhopala turbata*, *Bull.*, 345.
- Teinopalpus**, *Hope*, 509.
- Teinoprosopus**, *Feld.*, = *Teinopalpus*, *Hope*, 509.
- telamon, *Don.*, *Sericinus*, 484.
- telemachus, *Stand.*, = *Sericinus telamon*, *Don.*, var., 489.
- Telicota**, *Moore*, 600.
- telmona, *Gray.*, = *Sericinus telamon*, *Don.*, var., ♂, 486.
- tenebrosa, *Leech*, *Adopæa*, 591.
- tengstroemi, *Ersch.*, *Thecla* (*Lycæna*), 367, 368.
- teredon, *Feld.*, = *Papilio sarpedon*, *Liun.*, var., 524.
- Terias**, *Swainson*, 425.
- terpsichora, *Liun.*, *Oberth.*, *Aeræa*, 463.
- terpsichore, *Cram.*, = *Pareba* (*Aeræa*) *vesta*, *Fabr.*, 115.
- tessellum, *Hübner*, *Hesperia* (*Syrichtus*), 660.
- tetlys, *Mén.*, *Daimio* (*Pyrgus*), 564.
- thaidina, *Blanch.*, *Armanlia*, 489.
- thaitina, *Oberth.*, *Armanlia*, 489.
- thalia, *Leech*, *Acrophthalma*, 483.
- thalia, *Leech*, *Thecla*, 367.
- Thanaos**, *Boisdu.*, 580.
- Thaumantis**, *Westw.*, = *Stichophthalma*, *Feld.*, 113.
- thaumas, *Hufn.*, *Adopæa* (*Hesperia*), 590.
- Thecla** (part.), *Fabr.*, 356.
- themis, *Leech*, = *Neptis thibæ*, *Mén.*, var., 190, 191.
- thesæus, *Sicindob.*, = *Catochrysops enejus*, *Fabr.*, 337.
- thespis, *Leech*, *Zephyrus* (*Dipsas*), 388.
- thestias, *Leech*, *Neptis*, 196.
- thetis, *Leech*, = *Neptis thibæ*, *Mén.*, var., 190, 192.
- thyets, *Füss.*, = *Daimio tetlys*, *Mén.*, 564.
- thibetana, *Oberth.*, = *Anthocharis cardamines*, *Liun.*, var., 477.
- thibetana, *Oberth.*, = *Aguidas subhyalina*, var., 603.
- thibetana, *Pouj.*, *Euthalia* (*Adolias*), 138.
- thibetanus, *Oberth.*, = *Charaxes narceus*, *Hew.*, var., 126.
- thibetanus, *Oberth.*, *Hesperia* (*Syrichtus maculatus*), var. *thibetanus*, *Oberth.*, 578.
- thibetanus, *Oberth.*, *Parargo* (*Satyrus*), 63.
- thibetanus, *Oberth.*, = *Papilio polytes*, *Liun.*, var., 553.
- thibetensis, *Pouj.* (*Lycæna*), = *Zizera sangra*, *Moore*, var., 323, 324.
- thi-bæ, *Mén.*, *Neptis*, 190, 196, 197.
- thumbergii, *de l'Orza*, = *Anthocharis scolymus*, *Bull.*, 479.
- thumbergii, *Sieb.*, = *Papilio mennon*, *Liun.*, 544.
- thyodamas, *Boisdu.*, *Cyrestis*, 248.
- thyone, *Leech*, *Parnara*, 610.
- tibetana, *Elwes*, = *Grapta e-album*, *Liun.*, var., 263, 265.
- tibetana, *Mab.*, *Notocrypta* (*Pterygospidea*), 628.
- tibetanus, *Leech*, *M.S.*, *Ruhl.*, = *Parnassius jacquemonti*, *Boisdu.*, var., 496.
- Timelæa**, *Lucas*, 245.
- timeus, *Cram.*, = *Chrysophanus plukeas*, *Liun.*, 399, 400.
- Tirumala**, *Moore*, 3.
- titania, *Leech*, *Lethe*, 31.
- toona, *Moore* (*Hesperia*), = *Parnara pellucida*, *Murray*, 611.
- traetipennis, *Bull.*, = *Papilio macilentus*, 547.
- transiens, *Stand.*, = *Parnassius delphius*, var., 504.
- translucida, *Leech*, *Rhopalocampa*, 642.
- tremule, *Esper.*, = *Limenitis populi*, *Liun.*, var., 187.
- Trepichirois**, *Hübner*, 6.
- trimacula, *Leech*, *Lethe*, 32.
- trimacula, *Leech*, *Padaona* (*Taractroera*), 599.
- tristis, *Feld.* (*Cylio*), = *Melanitis aswa*, *Moore*, var., 108, 109.
- trivena, *Moore*, *Limenitis*, 187.
- truncata, *Moore*, = *Caretis acuta*, *Moore*, var., 349.
- tsangkie, *Oberth.*, *Zephyrus* (*Thecla*), 389.
- tseng, *Oberth.*, *Chrysophanus*, 463.
- turbata, *Bull.*, *Arhopala* (*Amblypodia*), 345.
- turcica, *Stand.*, = *Vanessa urtica*, *Liun.*, var., 259.
- turpulus, *Oberth.* (*Mycæsis*), = *Lethe butleri*, *Leech*, 24.
- tutanus, *Fenton*, = *Papilio maackii*, *Mén.*, var., 530.
- tydeus, *Leech*, = *Ctenonympha typhon*, *Rott.*, var., 196.
- typhon, *Rott.*, *Ctenonympha*, 196.
- tyrianthina, *Bull.*, = *Rapala arata*, *Brem.*, var., 381, 417.
- tytia, *Gray*, *Caduga* (*Danaüs*), 1, 463.

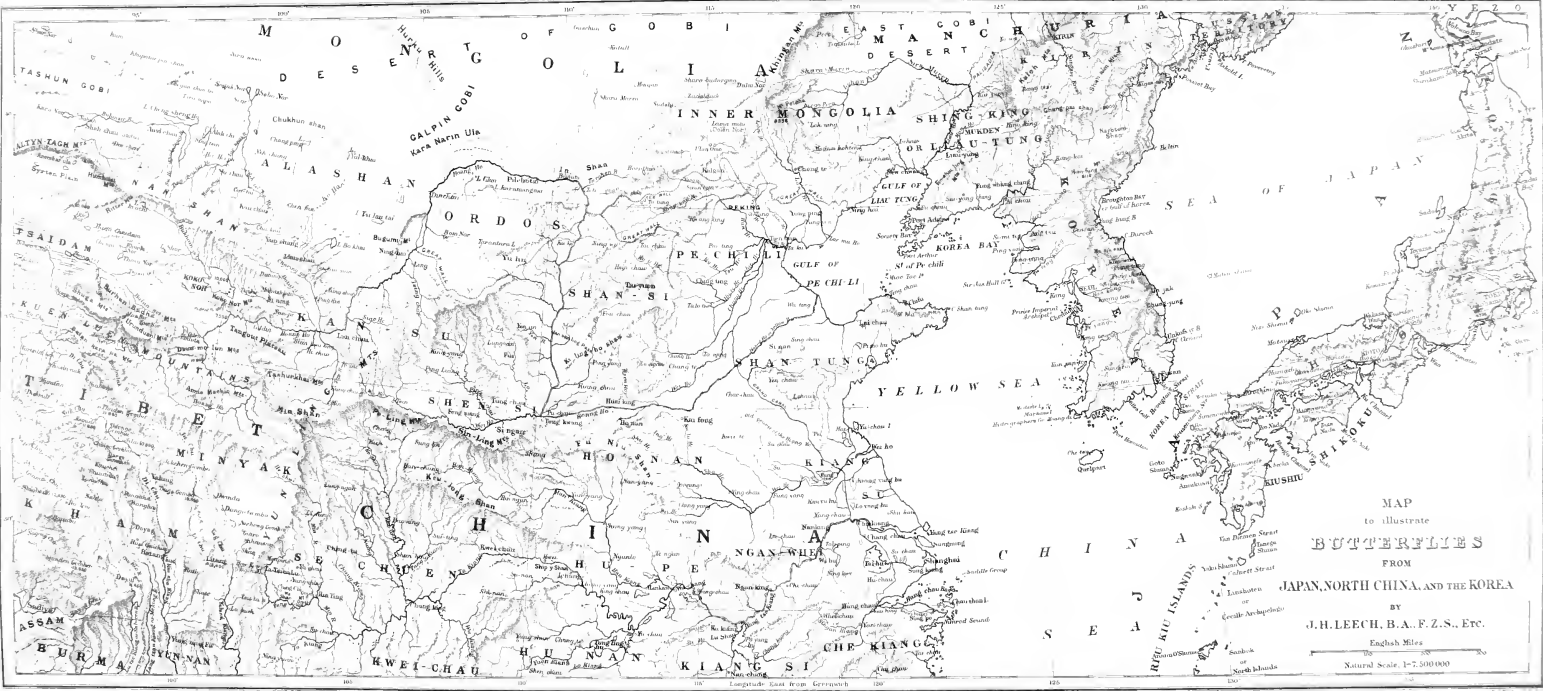
- uhleri, *Edw.*, (Eneis, 76.
 ultramarina, *Fics.*, = *Zephyrus taxila*, *Brem.*, var., 370.
 ulupi, *Doherty*, *Apatura* (Potamis), 159.
 umbriel, *Doherty*, = *Everes potanini*, *Alph.*, 332.
 unica, *Leech*, *Mycalesis*, 15.
 unicolor, *Brem. & Grey*, *Heteropterus* (Storopes), 584.
 unicolor, *Moore*, = *Baoris oceia*, *Heur.*, var., 617.
 urania, *Bull.*, *Gonepteryx*, = *Dercas wallichii*, ♀, 445.
 urticae, *Linna.*, *Vanessa*, 257.
 ussuriensis, *Staud.*, = *Limenitis populi*, *Linna.*, var., 188.
 v-album, *Godart.*, = *Vanessa vau-album*, *Wien. Verz.*, 261.
 v-album, *Oberth.*, *Thecla*, 363, 365.
 valesina, *Esper.*, = *Argynnis paphia*, *Linna.*, var., 239.
Vanessa, *Fabr.*, 253.
 varia, *Meyer-Dür.*, = *Melitaea parthenie*, *Bork.*, var., 214.
 varia, *Murray*, *Halpe* (Pamphila), 621.
 varmona, *Moore*, *Neptis*, 203.
 vasava, *Moore*, *Ctenoptilum* (*Achlyodes*, *Antigonus*), 575.
 vasutana, *Moore*, *Ismene*, 637.
 vau-album, *Wien. Verz.*, *Vanessa*, 261.
 venata, *Brem. & Grey* (*Hesperia*), = *Augiades sylvanus*, var., 601.
 venata, *Leech*, = *Aporia davidis*, *Oberth.*, var., 409.
 venata, *Leech*, = *Limenitis homeyeri*, *Taweré*, var., 183.
 verhuellii, *Hoer.*, *Dercas* (*Colias*), 446.
 veris, *Staud.*, = *Pieris melete*, *Mén.*, var., 451.
 verma, *Koll.*, *Lethe* (*Satyrus*), 23.
 vesta, *Fabr.*, *Parba* (*Acreae*), 114, 556.
 vestigiata, *Bull.*, *Salpiux* (*Euploea*), 8.
 vivilia, *Jans.*, = *Leucophasia sinapis*, *Linna.*, var., 483.
 violaceopicta, *Powj.*, *Lethe* (*Delis*), 39.
 virgata, *Leech*, *Padraona* (Pamphila), 598.
 virgaureae, *Linna.*, *Chrysophanus* (*Polymnatus*), 398.
 viridipunctata, *de Nicée*, *Ilerda*, 405.
 viridis, *Leech*, = *Hestina mena*, *Moore*, var., 143.
 visala, *Moore*, *Mycalesis*, 13.
 vitatha, *Moore*, = *Argynnis aglaia*, *Linna.*, var., 232.
 vitrea, *Leech*, *Coladenia*, 568.
 vitrea, *Murray* (Pamphila), = *Icteinon lamprospilus*, *Feld.*, 582.
 vitta, *Bull.*, *Hasora* (*Hesperia*), 638.
 vorax, *Bull.*, = *Argynnis adippe*, *Linna.*, var., 232.
 vulcanica, *Godart.*, = *Pyrameis indica*, *Hechst.*, var., 252.
 w-album, *Knoch*, *Thecla*, 358, 359.
 walkyria, *Fics.*, (Eneis, 77.
 wallacei, *Dist.*, = *Junonia orithyia*, *Linna.*, var., 280.
 wallichii, *Doubl.*, *Dercas* (*Gonepteryx*), 445.
 wedah, *Koll.*, *Pseuderzolis* (*Ariadne*), 275.
 whitelyi, *Bull.*, = *Lethe diana*, *Bull.*, 28.
 xanthodippe, *Fics.*, = *Argynnis adippe*, *Linna.*, var., 234.
 xanthomelas, *Esper.*, *Vanessa*, 260.
 xanthopogon, *Koll.* (*Hesperia*), = *Rhopaloe umpta bou-jainii*, *Guevin*, 641.
 xuthulus, *Brem.*, = *Papilio xuthus*, *Linna.*, var., 514.
 xuthus, *Leech*, *Everes*, 330.
 xuthus, *Linna.*, *Papilio*, 514.
 yama, *Moore*, *Neop.* (*Zophoessa*), 48.
 yankowskyi, *Grose Smith*, = *Hestina subdividii*, *Leech*, 145.
 yerburii, *Bull.*, *Neptis*, 204.
 Ypthima, *Heur.*, 88, 90, 91.
 Ypthima, *Oberth.*, 83.
 Ypthima, *Hübner*, 81.
 ypthimoides, *Oberth.*, ? = *Callerebia phyllis*, *Leech*, 102.
 yuenty, *Oberth.*, *Melitaea*, 220.
 yumana, *Oberth.* (*Argo*), = *Melanargia loda*, *Leech*, 60.
 zaïda, *Doubl.*, *Neptis*, 196.
 zaneka, *Moore*, *Gonepteryx*, 444.
 zelima, *Mitis*, = *Delias belladonna*, *Fabr.*, 420.
 zella, *Bull.*, *Hestina*, 145.
 Zemerus, *Boisd.*, 289.
 zenara, *Moore*, *Pisola*, 559.
 zenobia, *Leech*, *Argynnis*, 242.
 Zephyrus, *Dalm.*, 369.
 Zetides, *Hübner*, = *Papilio*, *Linna.*, 527.
 Zinaspa, *de Nicée*, 345.
 Zizera, *Moore*, 322.
 zodia, *Bull.*, *Ypthima*, 91.
 zoilus, *Moore*, = *Apameus lobata*, *Horsf.*, var., 410.
 zona, *Mab.*, *Hesperia* (*Scelothrix*), 577.
 Zophoessa, *Doubl.*, 41.

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ERRATA.



- Page 69, line 13 from bottom, for *siberica* read *sibirica*.
- .. 215, .. 13 from bottom, for *manschurica* read *manschurica*.
- .. 294, .. 15 from bottom, strike out the word "it" after "met with."
- .. 306, .. 9 from top, for *lahana* read *lhana*.
- .. 330, for *Everes zuthus* read **Everes xuthus**.
- .. 383, for *Zephyrus cælistis* read **Zephyrus cælestis**.
- .. 406, for *Ilerda brahama* read **Ilerda brahma**.
- .. 566, line 18 from top, for "N.E. Thibet" read "Sechuen."



MAP
to illustrate
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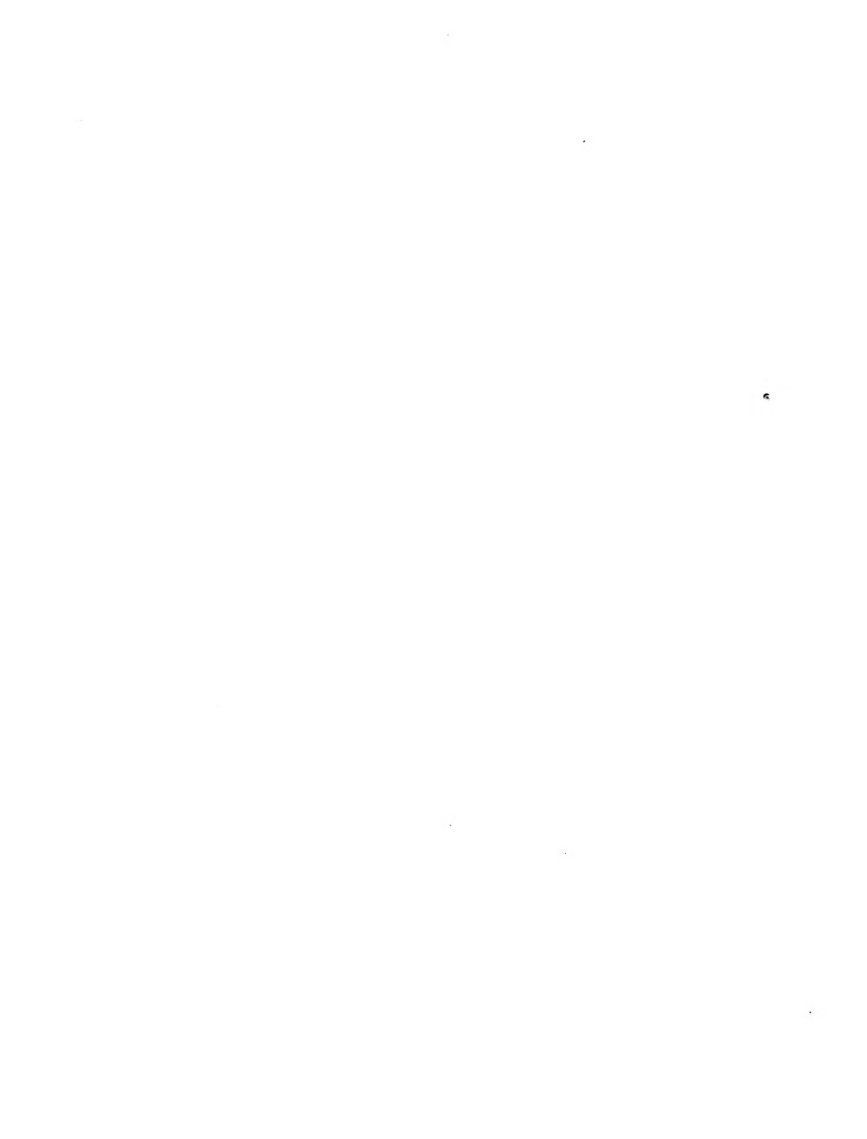


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FIGURE 1. THE UPPER MOUNTAINS









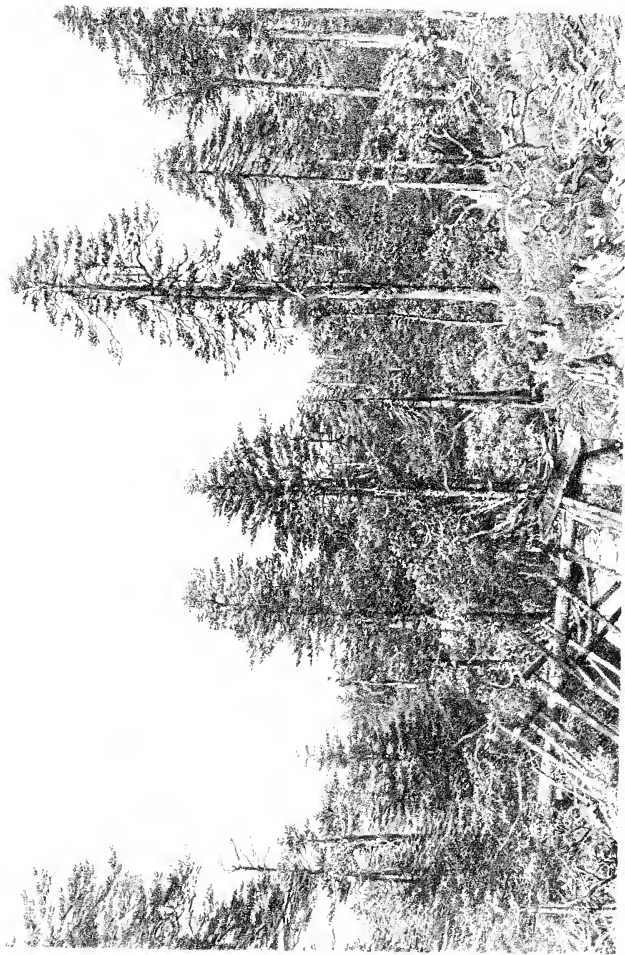
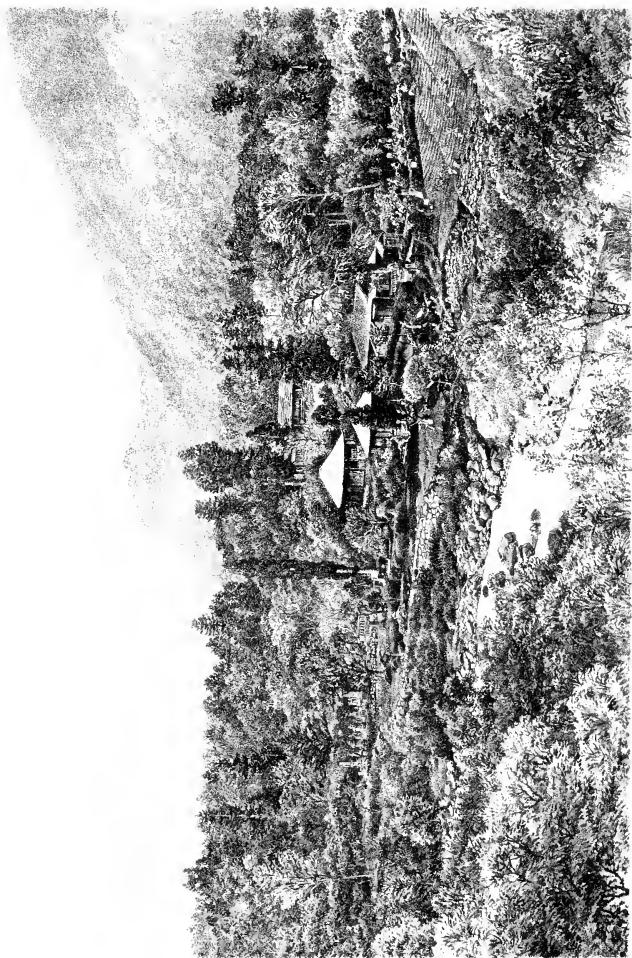


TABLE 1. Summary of the data presented in this paper.
TABLE 2. List of the authors and their affiliations.



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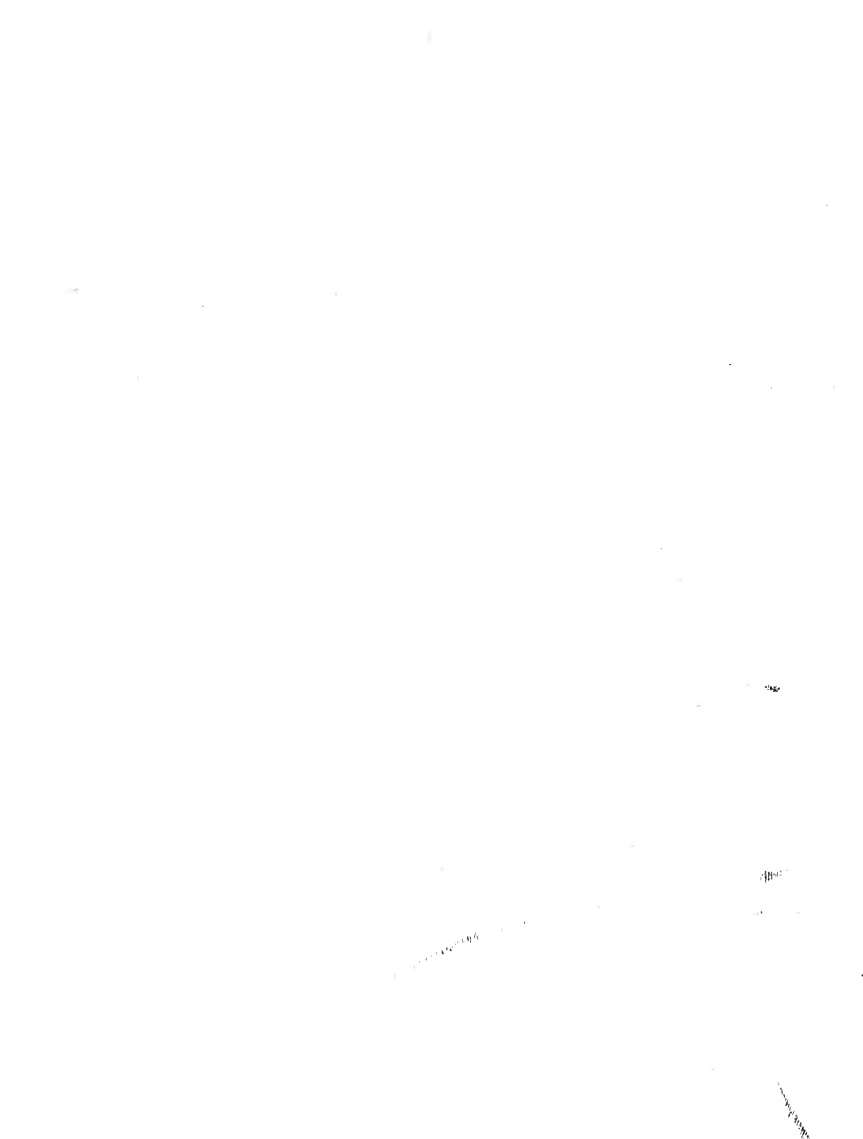
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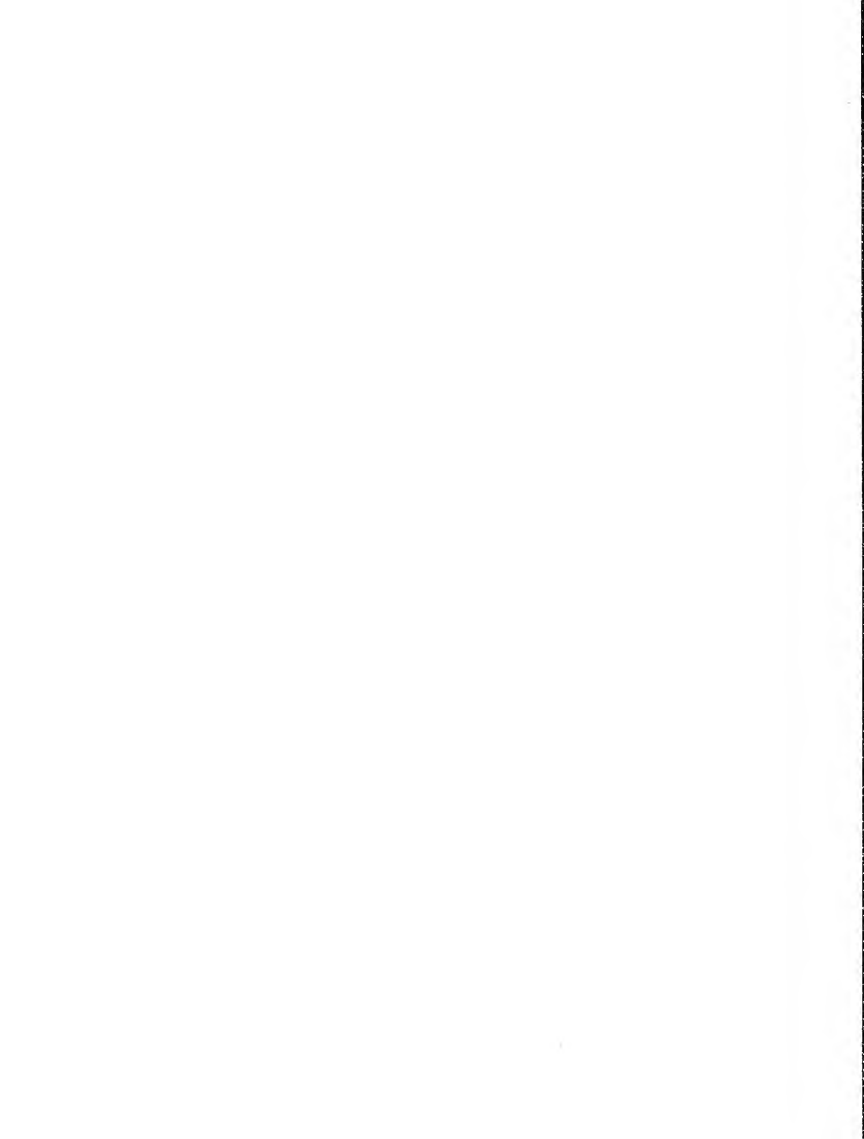
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