

slender line, and the upper discal spot and the streak are concave externally. Hindwing with a black pouch area [as usual] in the male."

"LARVA, cylindrical, reddish-purple, two black fleshy filaments on third and ~~four~~ on twelfth segment; two dorsal rows of round chrome-yellow spots, and a lateral row of broken chrome-yellow spots, with intervening white dots on each segment. Head and legs black, white spotted. PUPA green, much constricted below the thorax, with blue and golden scattered dots and black raised dots on upper segments. Feeds on *Cryptolepis*, &c." (Moore, l. c.).

* In his original short description of this species Felder remarks: "A local variety of *D. aglaea* from north India intermediate between it and *D. agleoides*, the Ceylon form differs from both by its less sharply defined white markings, and from *D. agleoides* also by its much broader streaks." It appears that both Felder and also Moore in his more recent works must have overlooked *D. grammica*, which was figured by Boisduval so long ago as 1836. *D. ceylanica* is really a local form of *D. grammica*, which is the common south Indian species, and only differs from it by its generally darker colour, owing to the greater preponderance of the swarthy ground-colour; some specimens from Travandrum are indistinguishable from *D. ceylanica*, although those from the Western Ghâts are notably paler as they extend northwards, and it is doubtful whether the name *ceylanica* should not be suppressed and the Ceylon species be included under the name *grammica*.

"Found everywhere all the year in open or partially cultivated places, but not often in forest. Flight slow and heavy. Perhaps the commonest Butterfly in Ceylon" (Hutchinson).

18. *Danais grammica*, Boisduval.

D. grammica, Boisd., Sp. Gén., Lép., vol. 4, pl. xi, fig. 10 (1836).

HABITAT: South India.

EXPANSE. 2.7 to 3.4 inches.

DESCRIPTION Boisduval's original figure, which unfortunately shows only the underside, and the costal margin of the forewing of the upperside, is the only authority for identifying this species, neither locality nor description being given. The figure corresponds exactly in markings with *D. ceylanica*, except that the outer of the three subcostal spots on the upperside of the forewing is wanting in *D. grammica*. The south Indian *Danais* of this type also corresponds in markings with *D. ceylanica*, but in a specimen from Belgaum the third subcostal spot is wanting, and the similarity with Boisduval's figure is complete. We have, therefore, even though this character is utterly inconstant, retained Boisduval's name for the south Indian species. The only points by which it can be distinguished from *D. ceylanica* are that it is slightly less black in general colouration, and on the upperside the marginal series of spots on the forewing is almost always complete to the apex in *D. grammica*, whereas in *D. ceylanica* it is seldom, if ever, complete; but if the localities were unknown it would be hardly possible to distinguish accurately between the species. There is little doubt that the Ceylon and south Indian species will eventually have to be united under the name *D. grammica*.

Moore records this species from Java and the Nicobars, and Butler records it from Moulmein, Malacca, and Java; but it is probable that *D. agleoides* is the species referred to in both cases, for out of the numerous collections we have received from Burma and the Nicobars, we have not found a single specimen approaching to *D. grammica*, while numerous specimens of *D. agleoides* have been sent. (See Journ. A. S. B., vol. 1, part ii, p. 224, 1881).

D. grammica has been taken in Travancore by Messrs. Bourdillon and Fergusson; in August in the hills near Travandrum, and in the Ashamboe range in May. In Calicut it has been taken in September; at Bangalore in August and November. A number of specimens were taken by Mr. G. Vidal, C. S., in the south Concan; on the Ghâts and on the Goanese frontier at 1,500 to 1,700 feet above the sea at the latter end of March; and in Belgaum it is common in October. A single specimen was also taken at Mahabaleshwar at

Christmas by Mr. E. H. Aitken, and there is a specimen from Poona in the Indian Museum, Calcutta; but there is no record of its occurrence further north. This species is well distinguished from *D. aglea* so far as our present knowledge goes, and the geographical ranges of the two species seem to be widely separated; no species of this group occurs north of the Bombay Presidency, where *D. grammica* occurs, till *D. aglea* is met with in N. W. sub-Himalayas on the West. Our knowledge of the East Coast fauna is very limited at present, but as yet *D. aglea* has not been recorded from any place south of Assam in India proper, while *D. grammica* is not known to extend further north than Madras. If specimens should ultimately be found extending northwards along the East Coast, as is not improbable, it will be interesting to discover what approach, if any, they make to *D. aglea*.

19. *Danais agleoides*, Felder.

D. agleoides, Felder, Wien. Ent. Mon., vol iv, p. 398, n. 17 (1860).

HABITAT: Burma, Malaya, Nicobars, Java.

EXPANSE: 2.7 to 3.2 inches.

DESCRIPTION: "MALE: Wings swarthy. Forewing with a costal streak and another internal one narrow, four wider discal ones, three costal spots, below the second of which a pair of elongated spots, then five in the disc and others external and marginal arranged in series, subhyaline; the apex above fuscous. Hindwing with seven streaks from the base, eight diversely formed discal streaks, and others placed irregularly in a double external row, subhyaline. Approximates very closely to *Danais aglea*, Cramer, but the wings are shorter and broader." (Felder, l. c.)

The above is a translation of Felder's short original description. The subhyaline markings on the upperside of the forewing are similar to those in *Danais aglea*, except being smaller, and the cell being divided along almost its whole length into three bluish-white streaks, which are joined at the base, the upper one being exceedingly narrow; and the intermedian area being occupied by two basally-joined streaks, the upper one much angled where the first median nervule is given off, the lower one straight. The hindwing has in the cell three hyaline streaks, the upper and lower ones joined at the base, the middle one short and lying outwardly between them. UNDERSIDE marked as above, but paler, wherein it differs much from *D. aglea*. As compared with *D. aglea*, *D. agleoides* is a much more compact and blacker insect, all the hyaline streaks being very narrow and the spots small. It is a very constant and well-marked species. The FEMALE only differs from the male in the absence of the sexual mark and the broader and more rounded outline of the wings.

It occurs commonly at Rangoon in January, July and September, and probably at other seasons also. On Nancowry Island, Nicobars, Mr. A. de Roepstorff took many specimens in August and September, and on Great Nicobar Island in October. It also occurs at Sambelong, Nicobars (Moore). Dr. J. Anderson took it very commonly in the Mergui archipelago in the cold weather. There is a specimen in the Indian Museum, Calcutta, labelled "Dukhan," "Sykes;" but the locality is probably erroneous, as *D. agleoides* appears to be confined to the east of the Bay of Bengal.

Third Group.—CHITTIRA. "Male with two scent-pouches, one spatular-shaped on the submedian nervure, accompanied by the dilated or swollen nervure, the other being the marginal nervure dilated, but without any adjacent spatular patch." (Moore, Lep. Ceylon, p. 8). This includes two distinct types as regards style of markings and outline of the wings; the first group is represented by two species only in India, which are confined to the Himalayas, Assam and Burma; they have the wings elongate, especially the forewing, and the hyaline markings greatly predominating at the base of the wings; the second group also contains only two Indian species, one peculiar to Ceylon, and the other to the hills of south India; they have the wings comparatively short and broad, and the hyaline markings narrow and much reduced, the colours generally being far more opaque.

Key to the Indian species of Chittira

A c Males with two scent pouches on hindwing, marked by dilatation of the submedian and internal nervures. Colours black or brown, with hyaline markings.

Forewing, elongate hyaline markings broad and extensive, occupying almost all the basal area of the wing. Of large size.

a² With the margin of hindwing broadly ferruginous.

20 D TYTIA, Himalayas, Burma.

β² With the margin of hindwing broadly swarthy, always with whitish minute marginal spots.

21 D MELANUS, E Himalayas, Burma.

Forewing somewhat short and broad. costal margin much arched, inner margin long, hindwing broadly oval, very convex externally. Antennæ with a tolerably thick club.
(*Chittira* as restricted by Moore) Hyaline markings reduced, narrow.

a² With white basal streaks on hindwing below the cell, and a brown streak in the whitish space on forewing below the cell.

22 D (*Chittira*) NILGIRIENSIS, South India.

α² With no white basal streaks on hindwing below the cell and with no brown streak in the whitish space below the cell in forewing.

23 D (*Chittira*) TAFROBANA, Ceylon.

20. *Danais tytia*, Gray.

D *tytia* Gray, Iep. Ind. Nepal, p. 9 pl. 38, fig. 2 (1846). Doubl. Hew. Gen. D. I., pl. 311 fig. 4 (1847). Moore, Proc. Zool. Soc. Lond., 1878, p. 822, *Danais uta*, Kol., Hug. Kusch., vol. IV, p. 424, pl. 15 (1848).

HABITAT. Himalayas, extending into Tenasserim.

EXPANSE: 3.5 to 4 inches.

DESCRIPTION: "Forewing black, with white semi-transparent spots between the nervures. Hindwing brownish-red, with the centre of the nervures near the base, and spots semi-transparent white, also a black spot at the anal angle" (Gray, l. c.) MALL. Forewing with the discoidal cell, three elongated decreasing spots along the costa; two streaks below these, the lower the longer, a spot below the end of the latter; two large spots between the second and third median nervures, two larger ones between the first and second, the inner one completely filling the angle made by the junction of the median nervure and first median nervule, the entire space between the median and submedian nervures to within one-fourth of the length of the wing from the outer margin; a narrow streak below the submedian nervure extending from the base half the length of the wing; a submarginal row of seven increasing spots, one between each pair of nervures, and an incomplete row of very small marginal spots not reaching the apex, two between each pair of nervures—hyaline bluish-white. Hindwing bright ferruginous, the disco-cellular and first and second median nervures black towards the margin; the discoidal cell hyaline, generally with a bifid streak within, not reaching the base; a small streak above the costal nervure at the base; an elongated streak below the costal, five spots around the end of the cell, one between each pair of nervures; two broad streaks connected at the base between the median and submedian nervures; and a single broad streak on either side of the internal nervure—hyaline bluish white. A few submarginal bluish-white spots from the apex and faint traces of a marginal series. The usual sexual marks near the anal angle blackish. Cilia black, spotted with white. Abdomen ferruginous, streaked with white below. UNDERSIDE with the markings generally similar to the upperside; the apex of forewing ferruginous; the marginal series of spots complete to the apex; and also complete, large and conspicuous on the hindwing. FEMALE: Similar to the male, except that the marginal and submarginal rows of spots on the upperside of the hindwing are more apparent, and the sexual mark is absent.

D *tytia* is one of the largest and most striking species of the genus, the wings are much elongated, and the forewing is somewhat falcate, especially in the male. It is found

throughout the Himalayas from Kashmir eastwards extending into Tenasserim; to the west it is comparatively rare, getting commoner towards the east. According to Col. Lang it is a forest-loving insect, frequenting in the Western Himalayas, wooded glens, at 6,000 to 7,000 feet altitude, with a high and soaring flight. In Kulu "it is not uncommon"; it has four broods—the first brood appearing in April at the lower altitudes; the second brood appears in June at about 6,000 feet elevation; a third brood appears in August and the first week in September; and the fourth, which is much the smallest in numbers, appears late in October. It is strong on the wing and a high flier; the long pendant flowers of the hill *toon* (*Cedrela serrata*) are much affected by it." (A. Graham Young). Near Simla it appears to be rare. Mr. de Nicéville, who has carefully explored the surrounding hills himself, only found *D. tytia* on the wing once, in a wooded glen near Theog on the Hindustan and Thibet road; and though it is said actually to swarm in the Simla hills in some years, it has not done so to his knowledge since 1876. From Mussoorie specimens were brought by Herr von Hugel. In Kumaon, according to Mr. E. T. Atkinson, it is common about Naini Tal and Almora from September to November. It has been reported also from Nepal and Bhutan. In Sikkim it is common; in the Khasi hills it is found in the autumn, and in the hilly districts of Burma it is common during the cold weather. It has also been found in Western Yunnan.

21. *Danais melaneus*, Cramer. (PLATE V, FIG. 5 ♂ ?).

Epilia melaneus, Cram., Pap. Ex., vol. 1, pl. xxx, fig. D (1775). Herbst, Pap., pl. cxxiii, fig. 5 (1793). *Hestia ephyræ*, Hubner, Verz. bek. Schmett., p. 15, n. 74 (1816). *Danais melane*, Godart, Enc. Méth., vol. ix, p. 192, n. 53 (1819); *Danais melaneus*, Moore, Proc. Zool. Soc. Lond., 1878, p. 822.

HABITAT: The Eastern Himalayas, extending through Burma to Malaya and Java.

EXPANSE: 3·1 to 4·4 inches.

DESCRIPTION: *Forewing* marked spot for spot as in *D. tytia*, but differs from that species in being less elongate and falcate; the *hindwing* also is shorter and rounder. The ground-colour of the *hindwing* is swarthy instead of bright ferruginous, and the bifid streak in the cell, which is generally present in *D. tytia*, is never seen in this species; the marginal and submarginal series of small spots are, however, more distinct. The UNDERSIDE agrees exactly in markings with *D. tytia*, but the ground-colour of the *hindwing* differs in the same way as it does on the upperside.

D. melaneus is found in Sikkim, Sylhet, and the Khasi hills in November. In October also Mr. de Nicéville found it in profusion in the Sikkim tarai and as high as 6,000 feet in the Darjiling hills. In Tenasserim it was taken by Limbong in the cold weather at Ahsown, Moulmein, and Meetan. Captain Bingham took it in the Thoungyeen forests in the Tenasserim interior in the spring months; and it has been found in Penang, Malacca, and Java. It is apparently a forest-loving insect, similar in habits and in general appearance to *D. tytia*.

The figure is taken from specimens from Sibsagar in the Indian Museum, Calcutta, and shows the upperside of both sexes; the female on the left, and the male on the right.

22. *Danais nilgiriensis*, Moore. (PLATE VI, FIG. 9 ♂).

D. nilgiriensis, Moore, Ann. and Mag. Nat. Hist., fourth series, vol. xx, p. 44 (1877).

HABITAT: Coonoor, Nilgiris; Ashamboo Hills.

EXPANSE: 3·0 to 3·8 inches.

DESCRIPTION: Fuliginous black, with bluish-white markings. *Forewing*, with a bluish-white, black-streaked, stripe within the cell; three subapical costal spots, below which are two narrow streaks, the lower elongated; five spots within the disc; an elongated, black-centered, triangular streak between median and submedian nervures; a submarginal series of seven spots, the lower, second, and third with a dentate point outward; a short marginal row of small dots from posterior angle. *Hindwing*, with a bluish-white, narrow, fusiform streak

within the cell; five contiguous small narrow spots outside the cell; three long narrow abdominal streaks; a submarginal series of spots, the upper two largest, the third dentate, the others small; a marginal row of smaller spots. *Head, thorax, and legs* black, spotted and streaked with white. *Abdomen*, blackish above, grey beneath. *UNDERSIDE* paler, markings as above." (Moore, l.c.) In the above description Moore omits to mention the presence on the upperside of the *forewing* of a narrow streak from the base half along the length of the wing below the submedian nervure; and on the *hindwing* there are four abdominal streaks, two joined at the base, between the first median nervule and the submedian nervure, and one on either side of the internal nervure. On the *UNDERSIDE* the *forewing* is darker in the middle of the disc, the *hindwing* irrorated with grey, except a discal band beyond the cell from the costa to the anal angle, which is brown, like the disc of the forewing. The *FEMALE* differs from the male in the absence in the *hindwing* of the sexual marks which are present in the male; the submarginal row of spots therefore consists of nine instead of six spots.

"Not common in the winter in Travancore; it occurs on the hills from 2,000 feet upwards; throughout February it is tolerably common. In April and May it was fairly common above 3,000 feet, and some specimens have been taken in June." (Harold Feigussou). Common at Conoor in July. It appears to be a local though very well-marked species, peculiar to the hills in the south of the peninsula.

The figure shows the upper and undersides of a male from Conoor in the Indian Museum, Calcutta.

23. *Danais taprobana*, Felder.

D. taprobana, Felder, Reise Nov., Lep., vol. ii, p. 349, pl. xlii, fig. 4 (1865), male; *Danais fumata*, Butler, Proc. Zool. Soc. Lond., 1866, p. 53; *Chittira fumata*, Moore, Lep. Cey., p. 5, pl. iv, figs. 11, 12 (1883).

HABITAT: Ceylon.

EXPANSE: 2.75 to 3.8 inches.

DESCRIPTION: "*UPPERSIDE*: *Forewing* rich brown, with a long discoidal streak; a large patch below the median nervure, extending from the base to the middle of the first median branch; two spots between the first and second median branches, one in the middle, and one at the base of the nervules; three submarginal spots, one below each of the median branches, and often a fourth below the lower discoidal nervule; an oblique band from beyond the middle of the costa to the middle of the third median branch, divided into five spots by the nervules; one or two minute spots near the end of the cell, below the third median branch, and two small obliquely placed subapical spots in, and nearly completing the submarginal series—pale-greenish white, semi-transparent. *Hindwing* rich brown; interior margin paler; the cell, a short streak above near its termination, a minute streak near the costa beyond the middle (often wanting), a minute spot beyond the end of the cell, a submarginal row of three small spots near the apex, and an incomplete marginal row of four or five minute dots (generally absent in the male)—pale greenish white, semi-transparent. *Cilia* brown with whitish interspaces. *Body*, brown. *UNDERSIDE*: *Wings* golden brown, a patch of darker colour below the end of the cell in the *hindwing*, markings nearly as above, but the basal hyaline marks much suffused with brown; only one subapical spot on *forewing*; and in the *hindwing*, the marginal dots are larger and present in both sexes. *BODY*: *Thorax* black, spotted with yellow. *Abdomen* pale ochreous." (Butler, l.c.) The *FEMALE* differs from the male only in the absence of the sexual marks, and in the presence of the marginal dots on upperside of *hindwing*.

This exceedingly well-marked species seems confined to the Island of Ceylon. There is no record of its capture on the Indian Continent. In Ceylon, according to Hutchison, it is "found all the year round, scarce in February and March; in the hills at from 3,000 to 6,000 feet elevation; in forest and often in coffee plantations. Common at Newera Eliya, and several miles round. Flight slow and heavy."

Fourth Group:—TIRUMALA: "Forewing broad, triangular; first branch of the subcostal nervure emitted at one-fifth before the end of the cell and free from the costal, the second emitted from the end of the cell. Hindwing broadly oval; exterior margin very convex; costal nervure slightly curved; cell short, anteriorly oblique; second subcostal branch starting from nearer the first, and third median branch nearer the second than in *Radema*. Male, with an open scent-pouch between the first median nervule and submedian nervure, the pendent sac of which is prominent on the underside. Antennæ shorter than in *Radema*, the club shorter and tip more pointed. Larva with two pair of fleshy filaments. Type, *D. limniaca*, Cramer." (Moore, Lep. Ceylon, p. 4, 1880).

This group is represented by three species in the Indian region, and a fourth is included on somewhat doubtful grounds. They appear to be more variable in their markings than the species of other allied groups of *Danais*, so much so that specimens are often found which it is difficult to identify with certainty. Their colouration is a beautiful indigo black with subhyaline bluish-white spots and streaks; all the species are of rather large size, and two of them are very common.

Key to the Indian species of Tirumala.

A. d. Males with one scent-pouch on hindwing, prominent on underside as a pendent sac. Colours blue black, with subhyaline markings

α². With two hyaline streaks from the base in the cell of forewing.

24. *D. (Tirumala) GAUTAMA*, Burma.

β². With only a single streak from the base in the cell of forewing.

α³. Hyaline markings large, prominent and very pale.

α⁴. Wings broad and short, marginal spots on hindwing brown, basal area of hindwing almost entirely hyaline, with no dark streak between median and submedian nervures

25. *D. (Tirumala) MELISSA*, India (?), Java

β⁴. Wings somewhat elongate, no brown spots on hindwing; marginal spots prominent; the hyaline mark between median and submedian nervures of hindwing cleft outwardly by a dark streak.

26. *D. (Tirumala) LIMNIACE*, India.

β³. Hyaline markings small, dark, and distinct, with no tendency to coalesce.

27. *D. (Tirumala) SEPTENTRIONIS*, India

24. *Danais gautama*, Moore.

α *D. gautama*, Moore, Ann. and Mag. Nat. Hist., fourth series, vol. xx, p. 43 (1877).

HABITAT: Arakan, Meplay Valley, Henzadah, Burma.

EXPANSE: 3'4 to 4'0 inches.

DESCRIPTION: "FEMALE: Black with bluish-white markings. Forewing with two long streaks within base of cell and three short streaks at its end; a series of five narrow streaks beyond end of the cell; six discal spots; two lengthened narrow streaks starting from base between the median and submedian nervures, and a spot beyond, the upper streak broken near its end; three small spots before the apex, and a marginal row of spots; a short streak at base of hind margin. Hindwing with three streaks within the cell, an elongated discal series of streaks, and two outer marginal rows of small spots." (Moore, l. c.) The MALE differs only from the female in having the black sexual spot, which is situated between the first median nervule and submedian nervure, and is produced into a pouch below with the opening on the upperside. UNDERSIDE like the upperside, except that the apical region of the forewing and the whole of the hindwing is ochreous brown.

"Most nearly allied to *D. septentrionis*, Butler, but differs in the shape of the forewing (that of *D. gautama* being shorter), the two basal streaks within base of the cell, the wider interspaces between the discal and marginal spots, and in the form of the streaks below the cell. On the hindwing it has an additional streak within the cell, and the discal streaks between the veins are broad." (Moore, l. c.)

D. gaulama, to judge from the recorded instances of its capture, seems to be very local. It has hitherto only been reported from a limited portion of British Burma. Captain C. T. Bingham took a single specimen in the Meiktila Valley in February, and Captain C. H. E. Adamson has sent a single male specimen from Moulmein, where it was captured on the 12th June, and Dr Anderson took it commonly in the Mergui Archipelago in December. It is probably not uncommon, but overlooked owing to its great superficial resemblance to the common *D. septentrionis*, though when once recognised it is a well-marked and easily distinguished species.

25. *Danais melissa*, Cramer.

Papilio melissa, Cramer, Pap. Ex., vol. iv, pl. cccxxvii, figs. C, D (1781); Herbst, Pap., pl. cxxx, figs. 3, 4 (1793); *Danais melissa*, Godart, Enc. Méth., vol. ix, p. 192, n. 50 (1819).

HABITAT: (N. India?, Singapore?); Java.

EXPANSE: ♂, 3.0 to 3.5 inches.

DESCRIPTION: MALE: *Forewing* black; a narrow streak in the cell from the base, and an irregular spot beyond it; one subcostal spot beyond the end of the cell, immediately below which are three elongate spots between the nervules; a round spot touching the cell below the third median nervule; a larger, somewhat elongate, spot below the second; and a large spot above an elongate basal streak with a small separate rounded spot beyond them, below the third median nervule; a sinuate submarginal series of nine spots, the apical four, one between each pair of nervules, the next four in pairs in the median interspaces; and a marginal series of smaller spots—subhyaline bluish-white. *Hindwing* with the entire cell; a spot at the base of the wing; a slightly larger one above the costal nervule at its base; a streak below it with a spot beyond; a spot between the subcostal branches touching the cell; two streaks filling the base of the interspaces on either side of the discoidal nervule; two short narrow streaks joined at the base in each of the two median interspaces, the outer pair much the smaller; the whole space between the median and submedian nervules from the base to the sexual mark; and three lengthened abdominal streaks, the two below the submedian nervule joined at the base; a very irregular submarginal series of small somewhat elongate spots—subhyaline bluish-white. A marginal row, equally irregular, of very small spots, white at the apex and anal angle, those between them brown. *UNDERSIDE*: *Forewing* black; *Hindwing* somewhat cupreous; the markings identical with those of the *upperside*, except that the marginal and submarginal spots are much more prominent, especially on the *hindwing*; both series are complete and all the spots are whitish with no brown tint. *Cilia* black, spotted with white. Described from Cramer's figures.

D. melissa is quoted by Westwood, Moore, and Butler as occurring in India, and on the strength of these authorities it is retained in the Indian list; but we have never seen a specimen taken in India, and we have great doubts as to whether it really does occur here. It is a Javan insect, and differs from the common *D. limniace* of India, which also occurs in Java, notably in having the basal area of the hindwing almost entirely hyaline leaving a prominent dark outer border,—in other words in *D. melissa* the hyaline spots on the outer half of the wing are reduced, and towards the margin evanescent, while those towards the base are enlarged greatly. Both these species vary much, and some specimens of the Indian *D. limniace* show an approach to *D. melissa* in the style of their markings, but none that we have seen could be separated from the Indian species or united with the Javan. The specimens of *D. melissa* from Java in the Indian Museum, Calcutta, differ from Cramer's figures on the *forewing* in having the three markings below the median nervule *entirely coalescing*, and on the *hindwing* in having a small dark streak in the cell, the hyaline streaks below it coalescing, making the abdominal area much paler, and the marginal spots bluish-white not brown, thus showing that this species is as liable to variation as is *D. limniace*.

26. *Danais limniace*, Cramer.

Papilio limniace, Cramer, Pap. Ex., vol. 3, pl. lix, figs. D, E (1775); Herbst, Pap., pl. cxxiii, figs. 3, 4 (1793); *Danais leopardus*, Butler, Pro. Zool. Soc. Lond., 1866, p. 52, n. 36; *D. limniace*, G. Semp., Jour. des Mus. God., heft xiv, p. 139, pl. viii, fig. 6 (1879); *Tarumala limniace*, Moore, Lep. Cey., p. 4, pl. i, fig. 3 (1880).

HABITAT : Throughout the Indian region.

EXPANSE : 2·6 to 4·2; usually about 3·5 inches.

DESCRIPTION : MALE : *Forewing* deep blue-black; a streak from the base, with an outwardly indented spot beyond in the cell; two short subcostal streaks (the outer sometimes evanescent) just beyond the cell, with three streaks immediately below them, one between each pair of the nervules, the first narrow, the second and third broader, the third short and oval; a spot touching the cell below the third median nervule, a larger and longer spot below the second, and in the space between the first median nervule and submedian nervule are an elongate streak from the base, above it a shorter and broader streak, and beyond them a rounded spot—subhyaline bluish-white; these three latter markings are very variable. In some specimens all three are distinct; in others the two streaks coalesce; in others again the upper streak coalesces with the spot leaving the lower streak free; and, lastly, all three sometimes are almost completely confluent. A sinuous submarginal row of nine unequal-sized, rounded, rather prominent spots, and a marginal row of ten to twelve smaller spots—also hyaline bluish-white. *Hindwing* also deep blue-black, with a spot at the base, a short streak above the costal nervule, another with a rounded spot beyond it below the costal nervule; a small spot near the cell between the subcostal nervules, a wide streak on each side of the discoidal nervule touching the cell; two short streaks united at the base in each median interspace, the outer pair much the smaller; a similar pair, but much wider, between the median and submedian nervules from the base to the sexual mark; a similar, but much longer, pair below the submedian, and a lengthened abdominal streak—subhyaline bluish-white. The discoidal cell in some specimens is entirely subhyaline; in others there is a single black streak near the end, and in others again this streak is bifid and very prominent. An irregular prominent submarginal row of spots; all those above the second median nervule are rounded; those below it somewhat elongate; the rounded spots are in pairs between the nervules with the outer of each pair large and the inner small; a more regular marginal row of smaller spots also hyaline bluish-white. UNDERSIDE agrees in markings with the upperside, but on the apical area of the *forewing* and the whole of the *hindwing* the ground-colour is cupreous. The *head* and *thorax* are blue-black, spotted and streaked with white. *Abdomen* swarthy above, and fulvous, with whitish spots below. FEMALE : Differs only from the male in the pair of subhyaline streaks below the median nervule being lengthened across the space occupied in the male by the sexual organ, which latter is of course absent in the female.

"*Larva* yellowish-white or yellowish-green, with a pair of long fleshy filaments on third, and a short pair on twelfth segment; the filaments black and greenish-white, longitudinally lined with black points; each segment with transverse black bars, one on each, thicker, which bifurcates near the lateral line; a narrower bar at anterior edge, and two, also narrower, at posterior part of the segment; lateral band yellow; head and feet ringed with black. *Pupa* green, somewhat cylindrical, constricted below the thorax, with golden scattered dots and beaded ring. Feeds on *Asclepias*." (Moore, Lep. Ceylon, p. 5). Figured in Horsfield and Moore's Cat. Lep. E. I. C., pl. iv., figs. 3, 3a (1857).

The range of this species is very wide. It is found in the driest as well in the dampest localities, and extends into the Himalayas up to at least 6,000 feet. In Travancore, according to Mr. Harold Fergusson, it is common from the foot of the hills to the summits, most abundant in November and December, common throughout February, only a few seen in March, but again fairly common at the higher elevations in April and May. It is common throughout the Deccan, extending into Sind, and throughout the plains of north India it is on the wing nearly all the year round; and in the outer Himalayas from Kashmir to Nepal. In Kulu Mr. A. Graham Young writes that it is common in some years, rare in others, and occurs in May, August, and October. Mr. S. E. Peal has taken it at Sibsagar in Upper Assam. It is not uncommon in Rangoon, and in the Nicobar Islands. In Calcutta it is plentiful all through

the year, and to be met with everywhere, particularly in gardens, where it is almost the commonest insect seen. Like the rest of the genus it has a slow flapping flight, and settles frequently, often at the very end of a dead stick.

27. *Danais septentrionis*, Butler. (PLATE VI, FIG. 8 & 9).

Danais septentrionis. Butler, Ent. Month. Mag., vol. xi, p. 163 (1874); *D. septentrionis*, G. Sempér, Journ. des Mus. God., heft xiv, p. 140, pl. viii, fig. 7 (1879); *Tirumala septentrionis*, Moore, Lep. Cey., p. 5, pl. i, fig. 2 (1880).

HABITAT: India.

EXPANSE: 3·4 to 4·4 inches.

DESCRIPTION: "Allied to *D. hamata*," of McLeay, but constantly much larger. UPPERSIDE: *Forewing* with the spots on the disc smaller. *Hindwing* olive-brown (instead of chocolate-brown); the streaks beyond the cell, between the subcostal and radial nervures, narrower, longer, and not notched externally; the brown patch in the cell broader (frequently reaching to the radial nervure without a notch); submarginal spots more elongated. UNDERSIDE: *Forewing* paler than in *D. hamata*; *hindwing* more cupreous in tint." (Butler, l.c.)

D. septentrionis is the common dark form of blue *Danais* that has frequently passed as *D. similis* in collections in this country. It differs from *D. limniace* in its usually larger size and in the deeper blue tone of the subhyaline markings, which are also smaller and more distinct throughout. On the *forewing* the streaks on either side of the lower discoidal nervule are narrow and pointed externally, the lower one always the shorter, whereas in *D. limniace* they are broad and truncate; the basal streak below the median nervure is short, narrow and widely separated from the spot above and the one beyond it, except in some specimens from S. India. On the *hindwing* the subhyaline markings in the cell are reduced to two streaks, with sometimes a minute spot between them at the outer end of the cell. On the UNDERSIDE the markings are similar to those of the upperside, and the cupreous tints of the fore and hindwings are much darker than in *D. limniace*.

This Butterfly seems to be less generally distributed than *D. limniace*. It has not been recorded from the Andamans or Nicobars, but is common in Tenasserim, in Assam, and in the Eastern Himalayas and tarais; it is rare in the Western Himalayas; and appears again in south India and Ceylon, but from the sub-Himalayan tracts on the north to Bangalore on the south we have as yet no record of its occurrence. The south Indian and Ceylon form is much smaller than that from north-east India. Specimens from south India (Bangalore, Kadir District, and Calicut) show an approximation to *D. limniace* in their much lighter general tone of colouration and the more or less complete coalescing of the spots and streaks behind the median nervure in the forewing; but the streaks on either side of the lower discoidal nervule are decidedly proportionally longer, narrower and externally more pointed, showing that these aberrant specimens really belong to the present species *D. septentrionis*. In the Simla district Mr. de Nicéville has taken it rather sparingly from August to October, and only in beds of streams with richly wooded sides; in one such locality near Kotgarh, elevation about 6,000 feet, it was fairly plentiful in August, 1879. Mr. A. Graham Young writes that "it very seldom occurs in Kulu, generally in July." In Chumba at 3,000 feet elevation there is a spring brood in April; and Mr. E. T. Atkinson, C.S., reports having found it common in the lower hills and plains below Kumaon; and Mr. F. Bourdillon has taken it in Travancore in May.

The figure shows the upperside of both male and female from specimens from Sibsagar in the Indian Museum, Calcutta.

Fifth Group.—*SALATURA*: "*Forewing* lengthened, triangular; costa slightly arched; apex more or less rounded; exterior margin waved, oblique, slightly convex in the middle;

* From Australia.

† See No 8, *D. vulgaris*.

inner margin slightly recurved; costal nervure extending to two-thirds the length, first subcostal branch emitted before end of the cell, second at end of the cell, third and fourth at equal distances from its end; cell long; upper disco-cellular bent inwards, and angled at its upper and lower end, lower outwardly oblique; radials from angles of upper disco-cellular; median branches widely separated, submedian slightly recurved. *Hindwing* broadly oval; exterior margin rounded, slightly sinuous; costal nervure short, curved upward, and emitting a short basal spur; first subcostal emitted before end of the cell, and curving upward before the apex, second slightly bent at end of the cell; disco-cellulars very oblique, upper shortest and slightly concave, radial from their middle; second median branch near end of the cell; lower bent near its base, submedian nearly straight, internal recurved. **MALE** with an open scent-pouch between first median nervure and submedian nervure. Body long; palpi pilose; middle and hindlegs slender. *Larva* with three pairs of fleshy filaments. Type, *D. genutia*, Cramer." (*Moore*, Lep. Ceylon, p. 5, 1880).

This group includes all the species of what are known as "tawny" *Danais*, and is represented within Indian limits by eight species, some of which probably are insular or local, and may eventually prove to be merely geographical varieties; some of them are exceedingly common, and two of them are found everywhere throughout the country, often in immense numbers. The group has a very wide range, extending from Eastern Europe throughout Southern and Eastern Asia, to Australia; also to South Europe, North Africa and North America. Out of the eight species included as Indian, the claim of one, *D. philene*, to admission is extremely doubtful; it is included on the authority of Butler's identification.

Key to the Indian species of *Salatura*.

B a Males with a scent-pouch on hindwing, situated as in *Tirumala*, but with the sac not so prominent on underside. Wings opaque, prevailing colour tawny yellowish-brown, with black and white markings.

a¹. The nervures of the wings not defined with black; the outer margin of both wings black, with white spots.

a². Apex of forewing black with a white subapical macular band.

a³. Hindwing uniform tawny

28. *D. (Salatura) chrysippus*, India.

b¹. Hindwing suffused with pure white

29. *D. (Salatura) alcippus*, N. W. India, Rangoon

b². Apex of forewing tawny, the white subapical band obsolete.

30. *D. (Salatura) dorippus*, Sind

b³. The nervures more or less broadly defined with black.

a². Hindwing bright ferruginous

a³. With white marginal and submarginal spots.

31. *D. (Salatura) genutia*,^{*} India.

b². Without white marginal and submarginal spots.

32. *D. (Salatura) niraxensis*, Nepal.

b³. Hindwing dull dark ferruginous, with fine bifid white spots on the disc on underside; nervures of forewing only partially defined with black on upperside.

33. *D. (Salatura) philene*, Punjab (?), Java.

b⁴. Hindwing very dark brown with pure white streaks.

a². With two oblique rows of white spots from costa of forewing; white streaks on hindwing large.

34. *D. (Salatura) hugesippus*, N. E. India, Orissa, Burma.

b². With the inner row of white spots on forewing evanescent or wanting; white streaks on hindwing narrow.

35. *D. (Salatura) hesippus*, Nicobars.

d². Hindwing dark brown with sullied white streaks.

36. *D. (Salatura) melasippus*, N. E. India.

^{*} *D. genutia* is the name under which the Butterfly, commonly known as *D. plexippus*, must stand; see detailed description of this species.

28. *Danais chrysippus*, Linnaeus. (PLATE VI, FIG 103 ♀.)

Papilio chrysippus, Linnaeus, Mus. Ulr., p. 263 (1764), Syst. Nat., vol. 1, pt. 11, p. 767, n. 119 (1767); Cramer, Pap. Ex., vol. ii, pl. cxviii, figs B, C (1777). *Papilio agestus*, Schreber, Nov. Sp. Ins., p. 9, figs 11, 12 (1759), Herbst, Pap., pl. cliv, figs 1, 2 (1794). *Danaüs chrysippe*, Godt., Enc. Méth., vol. ix, p. 187, n. 38 (1819). *Danaüs chrysippus*, Horsfield and Moore, Cat. Lep. E. I. C., vol. i, pl. 19, fig. 7, caterpillar, 72, chrysalis. *Salatura chrysippus*, Moore, Lep. Cey., p. 7, pl. 11, figs 1, male, 12, female, 13, caterpillar and chrysalis (1880).

HABITAT: Throughout India and Burma up to 7,000 feet elevation.

EXPANSE. 2.25 to 3.4 inches.

DESCRIPTION. MALE and FEMALE UPSIDE *Forwards*, with the costa narrowly, the whole apical area, including a small portion of the extremity of the cell, and decreasingly to the inner angle fuscous black; the rest of the wing bright ferruginous, darker in the cell and sometimes a little below and beyond it. A small quadrate spo. on the costa, about one-third the length of the wing from the base, a larger one beyond it, an oblique band of five spots from the costa to the third median nervule, divided by the black nervules; a small spot between the discoidal and third median nervules touching the cell, and sometimes a smaller one above it, a round spot, variable in size on the inner margin of the black apical area between the first and second median nervules, a submarginal and marginal series of small spots, the former always with two increasing spots at the apex, the series sometimes extending from the apex to the third median nervule, but generally with only the two spots below the macular band present, the upper one of the two always the largest, as are also the spots below them in the marginal series, white. In some specimens the apical area beyond the macular band is suffused between the veins with ferruginous. *Hindwing* bright ferruginous, narrowly bordered with a black band, irregular towards the apex, inwardly scalloped towards the anal angle. Three white spots at the apical angle, the upper disco-cellular nervule bordered with a black spot below the point where the second subcostal nervule is given off; another black spot where the discoidal nervule is given off, and a third filling the outer angle of the cell, where the third median nervule is given off. In some specimens the nervules on the disc are narrowly bordered with white. A marginal series of small somewhat squarish spots placed on the marginal black band, frequently evanescent towards the apex. The MALE has in addition a black sexual spot placed against the first median nervule, and extending into the space between it and the submedian nervule. *UNDERSIDE* *Forwards* as above, except that the macular subapical band of white spots is only inwardly margined with black, the apical area from that band almost up to the marginal black band being ochreous. There is also an additional spot along the costa of the submarginal series. *Hindwing* ochreous, all the veins and the spots on the disco-cellular nervules more or less bordered with white, the sexual mark in the male centred with a white spot, the marginal black band inwardly irregularly defined with white, and the marginal white series of spots always complete, lunular and much larger than on the upperside.

D. chrysippus is the commonest and most widely spread of all the Indian Butterflies. It is found throughout Eastern and Southern Asia, and even extends into Europe and North Africa. No locality seems to be unsuited to it. Up to a level of 7,000 feet above the sea, it may be found anywhere in the Indian Empire, but perhaps the dry hot plains of Northern India are on the whole the most congenial to it. At all events there it is the most conspicuous as it is almost the one solitary species that can thrive in the dust and glare. It seems moreover to be as indifferent to season as it is to locality, and in the plains of north India at all events it is to be found throughout the year, though most abundant in the winter months. It is hardly necessary to quote localities or dates in this case, for wherever the temperature is high enough, *D. chrysippus* may be found throughout the year. It has however not been recorded from the Andaman isles, though it occurs at the Nicobars. Only in the hills does its appearance seem to be governed by season. Mr. de Nicéville has only met with it in the Simla district in the autumn. Mr. A. Graham Young, writing from Kulu, gives, with reference to this species, the following note which is of interest as relating to its occurrence out of India:—

"Common in Kulu; the first brood appears in June, then a succession of broods from August throughout the autumn. I found a great number of the larvæ of this insect whilst marching through the Sialkot District in May. They were on that species of *Euphorbium*, so common on sandy ground in the Punjab. I bred a lot, but all that I can now remember is that they emerge from the pupa on the average in about twelve days. I first saw this insect while travelling through South Persia many years ago. I met with a few at Khaneh Zeenon, 32 miles south of Shiraz, early in April, and at Dasht-i-arjun, a grassy plain surrounded by mountains a few miles further on, elevation nearly 6,000 feet, they were out on the banks of a small river in swarms during six hours that I halted there. I must have seen some thousands, they were all fresh from the chrysalis, and the surrounding herbage was covered with these pupæ, and with newly emerged insects."

The following description of the caterpillar and chrysalis of *D. chrysippus* is taken from a paper by Mrs T. Vernon Wollaston in the *Ann. and Mag. Nat. Hist.*, fifth series, vol. iii, p. 221 (1879).

"The caterpillar of this *Danais* is rather more than an inch and a half in length, and of a delicate French grey, each segment being ornamented with five black transverse lines, the second and third ones of which are somewhat broader, and enclose too large yellow transverse patches. There is a yellow spiracle-line very much interrupted, the skin being puckered, and the spiracles themselves scarcely visible. The head has three broad, transverse, arched, black lines, the anterior one of which encloses a yellow space, bordered in front by a straight basal line. The third, sixth, and last segments are each furnished with a pair of conspicuous dark retractile (?) horns, the anterior pair of which are almost twice the length of the others. When fully fed, it suspends itself by its tail and turns into an obtuse semi-transparent chrysalis, beautifully marked with small golden spots, placed elliptically round the head, and with a black, raised, semi-circular line near the tail, the posterior edge of which is of a brilliant gold, there is also a minute golden spot about the position of the centre of the enclosed wings. These golden markings, however, disappear by the absorption of the fluids, as the enclosed insect approaches maturity."

The caterpillar feeds in India on *Calotropis gigantea* (Lang), *Asclepias curassavica* (Moore). The chrysalides in *Danais chrysippus* are dichroic, some being bright green, and others pale pinkish, wax-white, but Mr Wood-Mason has ascertained that this difference in colour is not sexual, males and females being produced indifferently from green and pink chrysalides, and he considers that we here have to do with an instance of 'the same animal at the same stage of its development being protected by its resemblance to two different parts of the vegetable organism on which it feeds and resides, namely, the leaves and the blossoms, the green chrysalises matching green leaves, and the pink ones being of a colour likely to be mistaken by birds, reptiles, and predaceous insects for a blossom.'

The figure, taken from a Calcutta specimen in the Indian Museum, Calcutta, shows the upperside of a male on the left and female on the right.

29 *Danais aloippus*, Cramer

Papilio aloippus, Cramer, *Pap. Ex.*, vol. ii, pl. cxxvii, figs. E, F (1777). Fabricius, *Ent. Syst.*, vol. iii, pt. 1, p. 50 n. 155 (1793). Herbst, *Pap.*, pl. clv, figs. 5, 6 (1794). *Euplasa aloippe*, Hübner, *Verz. bek. Schmettl.*, p. 15 (1816). Ochsenh., pl. iv, p. 120. *Danaus aloippe*, Godart, *Enc. Méth.*, vol. ix, p. 168, n. 39 (1819).

HABITAT: Plains of North-West India, and Rangoon.

EXpanse: 2.9 to 3.5 inches.

DESCRIPTION. This species differs from *D. chrysippus* in the *hindwing* on both the upper and undersides being more or less, particularly in the middle of the wing, suffused with pure white. This character is very varied in different specimens, both in uniformity and extent; in some, it covers the whole of the middle of the wing; in others it is confined to the area below the cell only, and again in others, it is streaked and sullied with fulvous.

Its appearance is so erratic over a large extent of country that in distribution as well as in inconstancy of the extent of white, the idea of its being only a casual variety of *D. chrysippus* is suggested; but the variety, if such it should prove to be, is so well marked that it is worthy of retention as a distinct species, until the discovery of the caterpillar, which is as yet unknown, sets the question at rest.

D. alcippus is found occasionally throughout the plains of Northern India. According to Major C. Swinhoe it is scarce in Sind, appearing in November and December. Mr. de Nicéville took two specimens at Nurgur in the Punjab in May. In the N. W. Provinces it is still more scarce, the only place where it is known to have occurred being Lucknow, where two specimens were taken by Col. Lang; towards the East it is certainly nowhere common. There is a single specimen from Rangoon in the Indian Museum, Calcutta.

30. *Danais dorippus*, Klug.

Euplaea dorippus, Klug, Symb. Phys., pl. xlviii, figs. 1-5 (1845); *Danais chrysippus*, var. c, Kirby, Syst. Cat. D. L., p. 7 (1871); *D. dorippus*, Oberthur, Études d'Entom., 3 me, livr., p. 24, pl. 1, fig. 5, (1878) male, from Zanzibar.

HABITAT: Sind, extending to South-Eastern Europe and Africa.

EXPANSE: 2'3 to 3'6 inches.

DESCRIPTION: This species may at once be distinguished from *D. chrysippus* by the absence on the UPSERSIDE of the forewing of the black apical patch, and the white subapical band, the spot outside the cell and the one on the inner margin of the black apical patch between the first and second median nervules. The submarginal row of spots in *D. dorippus* is generally entirely wanting; if present at all it consists of two or three spots between the first and third median nervules. The marginal series is also very abbreviated, three spots at the apex, and a few between the first and third median nervules being generally alone present, though sometimes the series is nearly complete, but the spots are always smaller than in *D. chrysippus*. Hindwing as in *D. chrysippus*, except that the marginal series of white dots is almost obsolete. UNDERSIDE bright fulvous; deep ferruginous colour nearly filling the cell; light ochreous at the apex. Two spots, one on each side of the discoidal nervule, just beyond and touching the cell, a subapical oblique band of five spots from the costa to the third median nervule, divided by the veins, (these spots are faintly seen on the upper-side through transparency)—white. Otherwise as in *D. chrysippus*. The hindwing is in all respects like that of *D. chrysippus*.

A single male specimen from Karachi has the whole cell of forewing and base of both wings, suffused with deep ferruginous on the upperside, and on the underside the whole cell and base of forewing only. Another female specimen from Muller, Sind, has the subapical band of white spots entirely absent.

The only notice of the occurrence of *D. dorippus* within Indian limits (it is common in Africa) that has been received is from Major C. Swinhoe, who writes from Karachi that he has observed it in Sind in January, June, August, September, November, and December, but never commonly.

31. *Danais genutia*,* Cramer.

Papilio genutia, Cramer, Pap. Ex., vol. iii, pl. ccvi, figs. C, D (1779); *Papilio genutius*, Herbst, Pap., pl. cliv, figs. 1, 2 (1794); *Salatura genutia*, Moore, Lep. Ceylon, p. 6, pl. iv, figs. 2 male, 3 female (1880); *Danais flexippus*, auctorum, nec Linnaeus.

HABITAT: Throughout India and Burma up to 7,000 feet elevation.

EXPANSE: 2'6 to 4'0 inches.

* For figures, see page 7.

DESCRIPTION: **UPPERSIDE;** *Forewing* bright rich fulvous, with the costa, the whole apical area to the inner angle, including the upper end of the cell, and decreasingly to the base along the inner margin—black. The median nervure and the first and second median nervules, which alone cross the fulvous ground, broadly bordered with black. On the costa there is first a small spot about one-third the length of the wing from the base, then two spots at the end of the cell divided by the first subcostal branch—white. A white spot touching, but outside the cell, between the discoidal nervules; an irregular band of six white spots from the costa to the second median nervule; this band increases to the fifth spot, which is the largest; the sixth is much smaller and rounded. There is generally one, sometimes two, round white spots on the inner edge of the black apical area between the second median nervule and the submedian nervule, one in each interspace; a submarginal and marginal series of white spots, more or less obsolete, especially towards the apex, but always present and large between the second and third median nervules. *Hindwing* lighter fulvous, margined with black, on which are placed two rows of rounded dots, the inner one evanescent, especially towards the apex. All the nervures broadly bordered with black. **UNDERSIDE** as above in the *forewing*, except that the area between the subapical band of white spots and the apex is suffused with ochreous. The submarginal and marginal series of spots are larger, as are also the spots on either side of the first median nervule when present. *Hindwing* only differs from the upperside in having all the nervures bordered with white outside their black margins; the two series of dots much larger. *Cilia* black, spotted with white at the interspaces. *Head* and *thorax* black, spotted and streaked with white. *Abdomen* ferruginous, spotted with white. In some specimens on the upperside of the *hindwing*, the abdominal margin and the fulvous spaces are more or less streaked or suffused with violet-white, showing an approach to *D. melanippus*. The **FEMALE** differs from the male only in the absence of the sexual mark, which in that sex is placed against the first median nervule and lies between it and the submedian nervure. On the upperside this mark is entirely black; on the underside black, centred with a short white streak.

"**LARVA**, cylindrical, black, with a pair of black fleshy filaments on the third, sixth, and twelfth segments, the first pair longest; each segment with one interrupted white streak along its anterior edge, succeeded by three white transverse spots, followed by two transversely elongated yellow spots, the posterior edge of the segment having two parallel interrupted white streaks; lateral band yellow, crossed at the middle of each segment by a black line; abdominal line black; head and feet black, ringed with white. **PUPA** somewhat cylindrical, posterior end hemispherical, anterior ending in two slight prominences; bright green, with a dorsal ring of silvery dots, and a few scattered golden dots." (*Moore, Lep. Ceylon*, p. 6.)

This species has hitherto passed as *D. plexippus*, Linnaeus, but Messrs. Salvin and Godman have recently shown conclusively in their "*Biologia Centrali-Americana*," that Linnaeus' name applies to an American species of this type, which is distinct from the Asiatic species. The error appears to have originated with Fabricius, and has till quite recently passed undetected. The Indian species must, therefore, stand as *D. genutia* of Cramer, by whom it has been correctly figured.

D. genutia is as widely spread and only less common than *D. chryxippus*. In Tenasserim it was found by Limborg throughout the cold weather up to 5,000 feet; in the Nicobars it is common; Captain C. T. Bingham found it in Tenasserim in March and April; it is common in the Malay Peninsula in August and September. In the plains of north India it is common throughout the winter; while in the Himalayas and Khasi hills it is most common in the autumn. In Kulu, according to Mr. Graham Young, a few appear in June, and from the middle of August, a succession of broods come out till late in the autumn; in Chumba a few are on the wing in April. On the West Coast it does not appear to be common, at all events in the spring, but in Travancore, according to Messrs. Fergusson and Bourdillon, it is very common in March, and fairly common in April.

32. *Danais nipalensis*, Moore

D. nipalensis, Moore, Ann. and Mag. Nat. Hist., fourth series, vol. xx, p. 43 (1877).

HABITAT : Katmandu, Nepal.

EXPANSE : 3·9 inches.

DESCRIPTION : "MALE : UPPERSIDE dull ferruginous black. *Forewing* with the basal internal half bright ferruginous, intersected by the black veins ; an oblique subapical narrow series of five white spots, the second, third, and fourth elongated, the fourth longest, the fifth subconical ; a series of two median submarginal, and four* marginal small white spots. *Hindwing*, with the spaces between the veins to beyond the disc ferruginous, intersected by broad black-margined veins. *Cilia* alternate black and white. *Head*, *thorax*, and *legs* black, spotted and streaked with white. *Abdomen* ferruginous. UNDERSIDE, paler ferruginous black, marked as above. Nearest to *D. chrysippus*, from which it may be distinguished by the absence of all white markings, except the narrow oblique subapical series on the forewing." (Moore, l c.)

This is apparently a local species ; no record of its occurrence elsewhere can be traced. It seems to be more nearly related to *D. genutia* than to *D. chrysippus*, but the description is given as originally recorded. We have never seen a specimen.

33. *Danais philene*, Cramer.

Papilio philene, Cramer, Pap. Fx., vol. iv, pl. cccxxv, figs. A, B (1781) ; *Herbst*, Pap., pl. cliv, figs. 3, 4 (1794) ; *Danaus philene*, Godt., Enc. Méth., vol. ix, p. 187, n. 37 (1819). *Euplaea philene*, Hübn., Vers. bek. Schmett., p. 15 (1816).

HABITAT : North India (?), Java, Amboyna.

EXPANSE : 3·6 inches, (from Cramer's plate).

DESCRIPTION : "Wings slightly sinuous, dark ferruginous, with here and there some nervures and the hinder margin of a blackish-brown, the latter dotted with white ; the *forewing* blackish at the apex, with a very white maculated band ; the *underside* of the *hindwing* with some bifid white spots on the disc ; size about the same as *D. plexippus* [*D. genutia*]. *Forewing*, blackish brown, with a large lengthened patch of dark ferruginous red at the base, divided by a blackish nervure ; a subapical white band of five spots, of which the four nearest the costa are oblong and joined, the fifth almost round and separated from the others ; this band is preceded interiorly by a longitudinal white line on the costa, and the hind [outer] margin has two rows of equally white spots, of which the inner line is shorter. *Hindwing*, dark ferruginous with blackish nervure, the outer border smoky brown, with a double or single row of white dots. The UNDERSIDE of the *forewing* is, with a slight difference in shade, almost the same as the upperside. In the *hindwing* it differs in that the disc has five white bifid spots, and the pocket in the male is marked with a small longitudinal line of the same colour ; also that the spots on the border are brighter, a little larger, and the two rows are both complete. The thorax is black with white dots ; the abdomen is brownish above, yellowish below ; the antennæ are black."

The above is Godart's description of this species, which is included in the Indian list on the strength of a notice by Mr. Butler* of a small collection of Butterflies made in the North-West Punjab, containing the following entry :—" *D. philene*, Cheta, about twenty miles from Murree ; found in lime and orange gardens." No other record of its occurrence has been traced, nor is it known whether any specimen exists in Indian collections ; and it seems likely that a mistake was made in the identification, for the insect belongs to the Indo-Malayan region, and wide-spread as many of the species of *Danainæ* are, it would be a singular occurrence if a Malayan species were found in the North-West Himalayas and not in the vast

intermediate region. It appears to differ from *D. genutia* chiefly in the nervures of the forewing being without the black borders on upperside, in the presence of the five bifid white spots in the disc of the hindwing on the underside, and in the tone of the ferruginous basal area of the wings.

The caterpillar and chrysalis were discovered by Horsfield in Java, and are figured in the Cat. Lep. E. I. C., plate iv., figs. 5, 5a (1857). The caterpillar has only four tentacula, two long ones on the third segment, and two short ones on the last segment but one; it feeds in Java "on a species of *cissus*, bearing the native name of *Galing*." (Horsfield.) It was found in December. The chrysalis is short and very obtuse. These figures are almost identical with those given at pl. iii, fig. 8, 8a, of Horsfield's Catalogue (1829), of *D. plexippus* (= *D. genutia*), and gives rise to the suspicion that the metamorphoses shown belong to one and the same insect, most probably of *D. philene*.

34. *Danais hegesippus*, Cramer.

Papilio hegesippus, Cramer, Pap. Ex., vol. ii, pl. clxxx, fig. A (1777); Fabricius, Ent. Syst., vol. iii, pt. i, p. 52, n. 160 (1793); *Euploea hegesippe*, Hubner, Verz. bek. Schmett., p. 15 (1816); *Danaüs hegesippe*, Godart, Enc. Méth., vol. ix, p. 189, n. 42 (1819); *Danaüs melanippe*, G. R. Gray, Lep. Ins. Nepal, p. 16, pl. ix, fig. 1 (1846); *Danaüs chirona*, G. R. Gray, l.c., p. 10 (1833).

HABITAT: Eastern Bengal, Orissa, Burma.

EXPANSE: 2.7 to 3.6 inches.

DESCRIPTION: UPPERSIDE: Forewing as in *D. genutia*, except that the fulvous streak below the submedian nervure is never present in *D. hegesippus*, the macular band of white spots across the apex is less prominent, and the sixth spot of this band is placed much nearer the base of the wing; the spot below it between the second and first median nervules is also usually much more prominent. In Cramer's figure the narrow fulvous streak below the submedian nervure is shown, but in a long series of Indian specimens before us it is invariably wanting. Hindwing fuscous brown in Cramer's plate, and also in some Rangoon specimens, but usually almost black. All the fulvous ground-colour of this wing in *D. genutia* is replaced in *D. hegesippus* with pure white, the streaks in the interspaces, beyond the cell being much more restricted, in some specimens being much reduced and sullied with fulvous at the edges; the marginal and submarginal series of round spots always complete, and more prominent than in *D. genutia*. UNDERSIDE similar to the upperside, but all the white markings on the hindwing are more prominent, and except the two long abdominal streaks are outwardly suffused with fulvous, increasing in extent towards the costa, the spaces above the subcostal nervure being almost entirely fulvous. The FEMALE only differs from the male in the absence of the sexual mark on the hindwing.

D. hegesippus does not seem to be very common anywhere. M. de Nicéville, who has carefully collected in the neighbourhood of Calcutta, notes: "On November 15th and December 18th, 1878, in a garden on the outskirts of Calcutta, I took two specimens of this insect on each occasion and have never seen it since. It seems to have a lower, and, if possible, lazier flight than *D. genutia*, from which species by reason of its white striped lower wings, it is easily distinguished even on the wing." Specimens may not unfrequently be found in the collections made by soldiers for sale in the neighbourhood of Rangoon, but neither Limborg nor Captain Bingham met with it in Tenasserim, in the winter and early summer months. There is one specimen in the Indian Museum, Calcutta, from Orissa; and another from the old East India Company's Museum, labelled "Dukhun, Colonel Sykes," but we know of no other specimen taken in that part of India, the locality is probably erroneous.

35. *Danaüs nesippus*, Felder.

D. nesippus, Felder, Verh. Verh. bot. Gesellsch. Wien, vol. xii, p. 456, n. 123 (1862); "Reise Nov., Lep., vol. ii, p. 347, n. 484 (1867).

HABITAT: Nancowry, Sambelong, Nicobars.

EXPANSE: 2.8 to 3.2 inches.

DESCRIPTION: "MALE: Wings above fuscous. *Forewing*, with the triangular basal area, rufescent fulvous; a three-fold subcostal spot (the cellular part and interior rather narrow), two small cellular spots, a small subapical band of five increasingly elongated spots, two spots between the median branches, and a double submarginal series of unequal spots (the inner row shorter), white. *Hindwing* paler, with the cellular area, and increasing subulate spots between the second subcostal branch, and the internal margin and somewhat large spots in two series before the margin, white. **UNDERSIDE:** *Forewing* paler, of a slightly violet tinge, the [fulvous] patch broader, with the white spots [of the upperside] but larger. *Hindwing* suffused with violet-hoary, with a serpentine gloss in certain positions, with basal spots, two subcostal (the first at the base emitting a line), and others on the border larger than those of the upperside, white; with the costa fulvous from the base, the radiating spots much more ample, with the upper ones exteriorly stained with ochraceous-fulvous, and with the two subcostal ones also of the same colour. **FEMALE:** Wings wider, more deeply coloured than in the male. A local form of *D. melanippus*, Cramer." (Felder, l.c. in Reise Novara).

Felder also remarks* that *D. nesippus* is "a local variety of *D. hegesippus*, Cramer, which as well as this and *D. melanippus*, Cramer, is again a local subspecies of *D. lotis*.† The Nicobar form differs from all the numerous specimens of *D. hegesippus*, which I received from Java and Malacca in the narrow, rust-red coloured streaks of the forewing, and the much narrower white radial spots of the hindwing. Regarding the latter difference it is nearer allied to *D. melanippus*, but the above mentioned streaks in this species are coloured ochre-brown."

We have a large series of this insect in our collection; it is an insular form of *D. hegesippus*, from which it differs in the almost complete absence of the first band of white spots outside the cell of the forewing, which in *D. hegesippus* are prominent, and the white streaks in *D. nesippus* are somewhat narrower. Mr. de Roepstorff took numbers of the species at Nancowry in August; and it is recorded by Felder from Great Nicobar.

36. *Danais melanippus*, Cramer.

Papilio melanippus, Cramer, Pap. Ex., vol. ii, pl. cxxvii, figs. A. B (1777). *Papilio hegesippus*, Herbst, Pap., pl. clv, figs. 7, 8 (1794).

HABITAT: Nepal, Assam, Penang, Malacca, Java.

EXPANSE: 3 inches.

DESCRIPTION: Differs from *D. genutia* in the *forewing* in not having any fulvous between the second and third median nervules, or below the submedian nervure; the macular subapical white band is less prominent, and the series between it and the cell is reduced to a spot on the costa. On the *hindwing* the fulvous patch in the cell pales almost to white inwardly, and all the streaks beyond the cell are very narrow and short, the abdominal streaks are also narrow. The marginal and submarginal series of white spots are very small and obsolete, especially the inner series, about the region of the third median nervule. The **UNDERSIDE** differs from that side of *D. genutia* in the same way as the uppersides of the two species differ one from the other.

D. melanippus is a native of Java; the above description is taken from Cramer's figure of a male specimen from that island. It is certainly very rare in India, if indeed the records of its occurrence are not cases of mistaken identity, though Butler, in his paper on the Malacca Butterflies, gives the above-quoted Indian localities for it.

* Verh. zool.-bot. Gesellsch. Wien, vol. xii, p. 486 (1862).

† From Java.

Genus 4. **EUPLEA**. Fabricius. (PLATES VII-IX).

Fabricius, Illiger's Mag., vol. vi, p. 280 (1807); Doubleday, Gen. D.L., p. 86 (1847); Butler, Proc. Zool. Soc. Lond., 1866, p. 268, *Monograph*; id., Journ. Linn. Soc., Zoology, vol. xiv, p. 290 (1878), *Monograph*; *Tropischer, Crastia, Salpinx*, Hübner, Verz. bek. Schmett., pp. 16, 17 (1816).

"**ANTENNÆ**, rather more than half as long as the whole length of the body, gradually clavate. **FORELEGS**, with the femur and tibia about equal in length; the tarsus shorter; of the **MALE** cylindric, rather tapering to a point at the extremity, indistinctly biarticulate; second joint about one-third the length of the first, both clothed with scales and hairs; of the **FEMALE**, clavate, quadriarticulate; the first joint longer than the rest combined, much broadest at the apex, where it has a stout spine on each side; second and third short, furnished with a tuft of hairs on each side near the base, and a spine at the apex; the fourth joint minute, furnished with a tuft of hairs. **MIDDLE** and **HINDLEGS** strong, the claws rather stout, curved. The **PARONYCHIA** divided into two laciniae; the outer elongate, lanceolate, hairy, as long as the claw; the inner not quite equal in length to the outer, more hairy, elongate, lanceolate, the apex curving inward over the base of the pulvillus. **PULVILLUS** not so long as the claws, jointed; the second joint broad, corneous." (*Doubleday*).

LARVA, with several pairs of elongate fleshy tentacula, usually on the penultimate, and on two or more of the anterior segments. **PUPA**, short, obtuse, with the abdomen much rounded.

The *Eupleas* are of rather large size; usually of a swarthy brown or black colour, sometimes rufescent, generally with a velvety appearance, and often with brilliant blue or purple reflections, especially in the forewing; more or less spotted with white or violet; sometimes streaked with white on the hindwing; typically the spots are arranged in a double marginal series on both wings, sometimes with a third discal row, but the extent to which these markings are developed varies greatly, and in many species some or most of them are entirely wanting. The thorax and head are spotted with white, especially below. In the forewing the inner margin is, in the **MALE**, usually much rounded outwardly, with a convex outline often covering a large portion of the hindwing even when the wings are extended for flight; in the **FEMALE** it is usually straight or very slightly convex towards the base, sometimes even emarginate or slightly concave towards the exterior angle. In some of the groups the males have one or two impressed silky streaks on the interno-median area of the forewing, composed of scales differently formed from those on the rest of the wing. These streaks, together with a patch of differently formed and paler scales present in some groups on the anterior portion of the upperside of the hindwing, and covered by the forewing, are probably scent-producing organs. The sexes in a few species also differ materially in the colour of the hindwing, the males having the wing nearly uniform dark colour, and the females having it streaked with white; but as a rule the differences in colour are slight, and the sexes are only to be distinguished by their structure and outline, and by the presence or absence of the sexual marks on the wings.

About 160 species of *Eupleas* have been described; it is an eastern-Asiatic genus, most highly developed in the Malay Archipelago, and extending into Australia. Species also are recorded from the islands of Mauritius, Bourbon, and Madagascar. Upwards of forty species are included in the Indian list, but owing to the variations in individuals and the indefiniteness of many of the original descriptions, their identification is often very difficult; many of the species inhabiting the same locality are so similar in appearance on the wing that some are apt to be overlooked. They affect patches of scrub in cultivation, and the edges of forests, and fly rather slowly and heavily; they are most abundant in warm, damp, tropical climates, and seem to shun dry places, whether cold or hot. Only a single species, *E. core*, is found commonly in India proper; no less than twenty-two species occur in Burma, of which some extend to north-east India; seventeen species are found in north-east India including those extending from Burma; seven species are found in the Andamans and Nicobars, all but two of which appear to be confined to those islands; three only are found in South India, but in Ceylon there are six species, all but one of which occur nowhere else within Indian limits. The foregoing remarks include as species all that have been separately described, although, as in the case of the allies of *E. core*,—*E. asela*, *E. vermiculata*, and *E. subdita*, the different forms are almost certainly only geographical varieties.

This genus was divided by Hübner into three or four groups, each with a well-marked general outline; and more recently Butler has extended this division into seven groups; more recently still Moore has discriminated two other groups, which will be noted further on, and is about to monograph the whole genus; but the characters of the new groups he has given seem to agree with those already discriminated by Butler, whose definitions are used in this book.

Key to the Groups of EUPLEA.

- A. With a large patch of whitish or pale yellow scales on the anterior portion of the hindwing in the male.
 - a. Forewing in the male, with the inner margin strongly arched, and having an elongated silky or blue spot depressed on the interno-median area; of medium size.
 - I. SALPINX* (Hübner, as restricted by Butler).
 - ♂. With no silky or blue depressed spot on interno-median area, of very large size
 - II. MACROPLEA (Butler).
 - c. With no silky or blue depressed spot on interno-median area, of small size.
 - III. CALLIPLEA (Butler).
- B. With a small yellow patch within the cell of hindwing at origin of first subcostal nervule; no brand on forewing in the male.
 - IV. TRITHECHROIS (Hübner).
- C. With no yellowish patch on hindwing in the male.
 - a. With no trace of a brand on the interno-median area of forewing of male.
 - V. CRASTIA (Hübner).
 - ♂. With a single more or less strongly defined brand on interno-median area of forewing of male.
 - VI. EUPLEA (Fabricius, as restricted by Butler).
 - c. With two well-defined brands on interno-median area of forewing in male.
 - VII. STICTOPLÆA (Butler).

There is something very remarkable about these groups; they are based almost entirely on the sexual marks of the male insect, but in many cases these distinctions are accompanied by differences of outline that cannot be mistaken; the most curious point is that frequently the same style of colouration runs through two or more of the groups; thus *Salpinx sinhalæ* and *Stictoplaea coroides* so closely resemble each other and *E. core* in colour and markings that until quite recently the distinctions were unrecognised. In like manner *Stictoplaea grotei* closely resembles *E. limborgi* in colour and markings; some specimens of the female of *Macroplea castelnau* are a very good likeness on a large scale of *E. godartii*. *Salpinx margarita* bears a similar resemblance to *Crastia cupreipennis* which occurs with it in the Mergui Archipelago and Upper Tenasserim, and *Crastia camarulsenan* from Siam. *Crastia simulatrix* closely resembles *Euplaea camorta*, &c., &c. The difficulty of distinguishing the species on the wing is a great hindrance to observation of the insects in life. The claim of the groups to generic rank appears still to be doubtful, and there is much to be learned in connection with them.

First Group.—SALPINX (Hübner, as restricted by Butler): "For the most part large insects, the males of which invariably have a strongly arched inner margin to the forewing, which is frequently ornamented with an elongated depressed silky or blue spot; the hindwing invariably with a large patch of whitish or pale yellow, cut by the subcostal nervure."—(Butler, Journ. Linn. Soc., Zoology, vol. xiv, p. 295, 1878). The wings are generally ample, and more or less rounded externally. The habitat of this group is extreme north-east India and Burma, extending down the Malay peninsula. Of the Indian species only one is found in the Nicobar islands, and one species is found in the neighbourhood of Calcutta, in Sikkim, and again in southern India and Ceylon; the whole of the remainder are found only to the north and east of the Bay of Bengal. One species of this group, *E. superba*, is taken by Moore in the Lepidoptera of Ceylon, p. 10 (1880), as the type of a new genus which, under the name of *Isamia*, he characterises as follows:—"Wings large, broad; forewing in male elongated, somewhat quadrate; apex slightly acuminate; exterior margin oblique, waved; posterior margin convex, with a large sericeous streak between the first median nervule and submedian nervure; hindwing triangular, costa long, convex; exterior margin convex, waved; a moderate-sized pale upper discoidal patch."

* Includes *Isamia*, Moore.

† Includes *Narmada*, Moore.

No explanation of any kind is given as to how this differs from *Salpinx* of Hübner, or from *Salpinx* as restricted by Butler, or why the older name has been dropped. *E. superba* and its allies certainly differ from other species of *Salpinx* in the form of the sexual brand of the forewing, but it is more probable that they are really different forms of a single species than a group of species forming a distinct genus.

Key to the Indian species of SALPINX.

- A. Forewing comparatively narrow and elongated, the apex acute. Males with a prominent elongate sericeous streak on the forewing, somewhat as in true *Euploea*, scarcely visible on the underside. All more or less shot with brilliant blue; and with a prominent lilac spot in the cell of the forewing on the underside.
 - a. Forewing with numerous violet or white spots in three series.
 - a.¹ The brilliant blue shot reaching the submarginal row of spots on the forewing; the border spots of the hindwing white and prominent.
 37. *E. (Salpinx) SUPERBA* (North India?), China.
 - ♂.¹ The brilliant blue shot reaching the marginal row of spots on the forewing.
 - a.² The border spots on the hindwing very indistinct or obsolete.
 38. *E. (Salpinx) ROGENHOFFERI*, N.-E. India, Burma.
 - ♂.² The border spots on the hindwing pale, but distinct.
 39. *E. (Salpinx) IRRAWADDA*, Burma.
 - ♂. Forewing with few and indistinct spots, no series complete; the border spots of the hindwing white and prominent.
 - a.³ The brilliant blue shot variable in extent, but usually covering the basal two-thirds only of the forewing.
 40. *E. (Salpinx) MARGARITA*, Tenasserim.
 - B. Forewing shorter and very broad. Males with a broad short oval sericeous brand, not prominent, generally concolorous with, but paler than, the ground colour, visible on the underside as a raised dark spot. The blue shot less brilliant and often wanting, no spot as a rule in the cell of the forewing on the underside.
 - a. Forewing very broad, with a decreasing row of submarginal spots, the third largest, border spots of the hindwing small but prominent.
 - a.¹ Forewing brown, sometimes faintly glossed with blue at the base.
 41. *E. (Salpinx) CRASSA*, Burma.
 42. *E. (Salpinx) HICKSONI*, Burma.
 - ♂.¹ The basal area of the forewing brilliant blue.
 43. *E. (Salpinx) MASONI*, Burma.
 - ♂. Forewing less broad, with the row of submarginal spots all nearly equal-sized.
 - a.¹ The blue shot usually suffusing the entire forewing, but very variable in intensity.
 44. *E. (Salpinx) KLUGI*, N.-E. India.
 45. *E. (Salpinx) GRANTII*, Cachar.
 - ♂.¹ The blue shot brilliant, but not reaching the outer margin of the forewing; the discal series of spots abbreviated, the third considerably the largest.
 46. *E. (Salpinx) ILLUSTRIS*, N.-E. India.
 - E. (Salpinx) CHION*, Malacca.
 - E. (Salpinx) AEGYPTUS*, Malacca.
 - c.¹ The blue shot usually entirely wanting, faintly present in some specimens; the forewing brown, with border spots as in *E. core*.
 47. *E. (Salpinx) SINHAIA*, Sikkim, Calcutta, S. India, Ceylon.
 - C. Forewing shaped much as in the preceding group. Male with a broad violet streak on the intermedian area; visible on the underside as a dark raised spot.
 - a. Forewing with no large white patch from middle of costa; the hindwing without white basal streaks on the upperside.
 - a.¹ Forewing shot throughout with deep blue, with prominent violet spots.
 - a.² The marginal series of spots partially present near the hinder angle of both wings.
 48. *E. (Salpinx) VESTIGATA*, Malacca.
 - ♂.³ The marginal series of spots absent from both wings.
 49. *E. (Salpinx) NOVAM*, Nicobars.
 - ♂.¹ Forewing blackish-swarthy; the hindwing with the anal angle white.
 50. *E. (Salpinx) LEUCOGONY*, (N.-E. India?), Malacca.
 - ♂. Forewing with a large white patch from middle of the costa; the hindwing with white basal streaks on both sides; of smaller size.
 - a.¹ Wings shot with deep violet-blue.
 51. *E. (Salpinx) RHADAMANTHUS*, N.-E. India, Burma.
 - ♂.¹ Wings not shot with violet-blue.
 52. *E. (Salpinx) DIOCLETIANUS*, (N.-E. India?), Burma.

The first four species, *E. superba*, *E. rogenhoferi*, *E. irawada*, and *E. margarita* are very closely allied, and may possibly be only different forms of the same species; the type of the group is *E. superba*, which has the forewing with three series of violet and white spots and shot with brilliant blue as far as the submarginal series, while the hindwing has two rows of white and prominent border spots; *E. margarita* only appears to differ from it in the almost entire absence of spots on the forewing; and in that it has the blue shot variable in extent, never reaching beyond the submarginal series of spots, and frequently confined to the basal two-thirds of the forewing; the extent to which the spots on the forewing are present varies greatly in this species, and some examples approach very closely indeed to *E. superba*. *E. rogenhoferi* and *E. irawada*, on the other hand, differ chiefly in having the blue shot of the forewing extending to the outer margin, and the border spots of the hindwing either pale or obsolete; *E. irawada*, the Burmese form, has the spots of the hindwing distinct, while *E. rogenhoferi*, the Assamese form, has, as is the case in several parallel instances, the border spots almost, if not quite, obsolete. Typical specimens can easily be distinguished, but none of the distinctive characters seem to be altogether permanent.

The FEMALEs in this group are usually coloured and marked like the males, but lack the sexual brand on the forewing and the yellowish patch on the hindwing, and have the inner margin of the forewing nearly straight. *E. hadamanthus* and *E. diocletianus* are the only species of this group in which the sexes differ at all widely in colour and markings.

37. *Euplea superba*, Heist.

Papilio superbus, Herbst, Pap., vol. v, pl. cxix, fig. 3, female pl. cxx, figs 1, 2, male (1792); *Papilio midamus*, Fabricius (nec Linnaeus), Syst. Ent., p. 479, n. 101 (1775), female Linnaeus mutabilis midamus, Hübner, Samml. Ex. Schmett., p. 16 (1816), *Danaus alopius*, Godart, Enc. Méth., vol. ix, p. 177, n. 4 (1819), *Euplea superba*, Horsfield and Moore, Cat. Lep. E. I. C., p. 131, n. 266 (1857), *Isamus superba*, Moore, Lep. Cey., p. 10 (1880).

HABITAT: (Darjiling *apud* Mooie?, North India *apud* Butler?); China.

EXPANSE: 4.2 inches.

DESCRIPTION: MALE: UPSIDE — *Forewing* deep brown, lighter towards the outer margin, suffused with brilliant blue up to the submarginal series of spots. A subcostal spot above the extremity of the cell, bluish-white. A spot in the cell, and a series of six spots, the third and fourth the largest, exterior to it, violet. A long dark impressed sexual mark in the interno-median area. A submarginal sinuous series of seven white spots, the second from the apex the largest, the seventh minute, sometimes geminate. A marginal series of small round white dots, obsolete towards the apex. *Hindwing* cupreous-brown, darkest about the median nervure, very pale on the costal area. A white patch across the subcostal nervure extending into, below, and beyond the cell. A submarginal row of spots, the two upper ones rounded, the third geminated, the remainder elongated; a marginal series of small round spots, all chalky-white. *UNDERSIDE* bronzy-brown, darkest on the disc. On the *forewing* the discal series of spots are reduced to two, one in each space between the median nervures, the lower elongated, violet-white. The marginal and submarginal series of spots as on upside, white. The inner margin broadly white. The *hindwing* has several white spots at the base; a small spot in the cell, and beyond it six small streaks, all violet-white. The submarginal and marginal series of spots on both wings as above, except that they are larger and clearer white. The FEMALE differs from the male in the absence of the sexual brand, and the inner margin of the *forewing* being straight, not outwardly lobed, as in the male. No patch of chalky-white scales on the anterior portion of the *hindwing*. Described from specimens from China in the Indian Museum, Calcutta.

We have never seen a specimen taken in India. It is entered in the list of species occurring within our limits on the strength of Horsfield and Moore's and Butler's identifications, but we doubt its occurrence there.

38. *Euplea rogenhoferi*, Felder.

E. rogenhoferi, Felder, Reise Nov., Lep., vol. ii, p. 375, n. 446 (1865), male, *E. splendens*, Butler, Proc. Zool. Soc. Lond., 1866, p. 272, n. 9, male.

HABITAT: Eastern Himalayas, Upper Assam, Cachar, Khasi Hills, Bassein.

EXPANSE: 3'4 to 4'4 inches.

DESCRIPTION: "MALE: UPPERSIDE.—*Forewing* blackish swarthy, shot throughout with greenish blue; the outer margin with two series of white spots, the marginal series not reaching the apex, the submarginal series with the forepart arched from the costa, but not reaching the inner margin; with a short angulated series of seven oblong violet spots placed beyond the cell, and extending from the costa above the cell to the lower median interspace; one spot near the end of the cell; and a pale streak placed below the first median nervule. *Hindwing* paler, slightly bluish, the costal area pale; a rather large ochreous spot placed on the subcostal nervure, and two series of very indistinct spots on the outer margin. The *body* swarthy, dotted with white anteriorly. **UNDERSIDE:** *Forewing* coppery-fuscous, the inner margin pale, with the series of submarginal spots as on upperside, but the inner series with smaller spots; a spot below the middle of the costa, one near the end of the cell, one below the end of the cell, and one large oblong spot between the median nervules—white. *Hindwing* coppery-fuscous, with two series of white submarginal spots; the inner series being of minute dots; with an angulate series of violet-white spots beyond the end of the cell, and one spot in the cell, and some white dots at the base. *Body* swarthy, the thorax dotted with white."

"Allied to *E. superba*, Herbst [from North India (?) and China], but more brilliantly shot with variable blue-green; the outer margin of the forewing more arched; the costa of the hindwing not so angular; the discoidal spots of the forewing much larger and oblong, and the submarginal spots smaller; the submarginal spots of the hindwing nearly obsolete. Below, the discoidal spots are much more distinct and larger, the submarginal spots of the forewing more numerous, and the inner submarginal series of the hindwing very small, especially towards the apex and anal angle." (*Butler*, l. c.) The FEMALE differs from the male in the absence of the sexual mark on the upperside of the forewing, but it has a long pale, violet streak on the underside in the position occupied by this mark in the male; the inner margin is also straight, not lobed, as in the male. No anterior creamy-white patch of scales on the hindwing. UNDERSIDE somewhat lighter in both wings.

E. rogenhoferi is found, but not very commonly, in Assam, extending through the Eastern Himalayas as far as the valley of the Sardah, which separates Kumaon from Nepal. To the westward of this range it is much rarer than to the eastward. Mr. Wood-Mason took three males and a female in Cachar from April to June. The specimens from Bassein of this group which we have identified as *E. rogenhoferi* agree with the description of *E. irawada*, the next species, and may possibly be referable to it. At any rate the two are closely allied, and only appear to differ in the comparative prominence of the spots on the hindwing and possibly also in the tone of the blue shot.

39. *Euploea irawada*, Moore.

E. irawada, Moore, Ann. and Mag. Nat. Hist., fourth series, vol. xx, p. 45 (1877).

HABITAT: Henzada, Rangoon District, Burma.

EXPANSE: 3 5 inches.

DESCRIPTION: "MALE: UPPERSIDE, dark blackish brown, *Forewing* glossed with brilliant steel-blue; a lilac-blue spot at lower end of the cell, and a contiguous discal series of six similar spots; a marginal upper series of six small white spots, and a marginal lower row of white dots; an elongated, silky, impressed streak between first median nervule and submedian nervure. *Hindwing* with a flesh-coloured patch extending over upper part of the cell, anterior margin broadly cinereous; a submarginal row of pale oval spots, and a marginal row of small round spots. **UNDERSIDE** brown. *Forewing* suffused in the disc with black; hind margin broadly and an elongated lower discal spot cinereous white; second discal spot and cell-spot blue, upper spots minute, marginal rows of white spots distinct. *Hindwing* with marginal row of distinct white spots, submarginal row partly obsolete; a small blue spot at end of, and a contiguous series outside the cell." (*Moore*, l. c.)

E. irawada appears to be very rare; we know of no specimens in collections in India, unless those of *E. rogenhoferi* from Bassein referred to above really belong to this species. These specimens answer exactly to the description of *E. irawada*, but they are inseparable from the Assam examples of *E. rogenhoferi*.

40. *Euplexa margarita*, Butler.

E. margarita, Butler, Proc. Zool. Soc. Lond., 1866, p. 279, n. 34; *Salpinx margarita*, Moore, Id. 1878, p. 823; *E. adamsoni*, Marshall, Journ. A. S. B., vol. xlix, part ii, p. 245 (1880).

HABITAT: Upper Tenasserim, Penang, Malacca.

EXPANSE: ♂, 3'6 to 4'2; ♀, 4'1 to 4'5 inches.

DESCRIPTION: "UPPERSIDE, olivaceous-fuscos; forewing fuscous, shot with blue and green, with one white costal spot; in the MALE with two blue discal spots, one subapical dot, one anal, and one submarginal, ochreous; in the FEMALE with one white discal spot. Hindwing of the MALE with the costal margin ochreous-white, a rather large ochreous subcostal spot, and two submarginal rows of ochreous-white spots on the outer margin; of the FEMALE with two rows of spots, those at the anal angle coalescing; the inner row elongate. Body swarthy, blackish in front with white spots. UNDERSIDE paler; forewing with some scattered submarginal white dots, and one costal, two discal spots, the lower large and elongate, and a lunule in the cell, iridescent; the inner margin pale. Of the FEMALE with an elongate ochreous discal streak placed near the margin. Hindwing of the MALE with five dots, of the FEMALE with six discal, and two in the cell, white, iridescent; the submarginal spots as on the upperside; and the base dotted with white. Body blackish swarthy, dotted with white. Antennæ black." (Butler, l. c.).

The brilliant blue shot does not, as would be gathered from the original description above, cover the entire forewing; it never extends beyond the submarginal series of spots, and in many specimens it does not cover more than two-thirds of the distance from the base, the whole of the outer portion of the wing being paler bright brown with no trace of blue. In typical *E. margarita*, where the blue shot extends to the position of the submarginal series, the costa is comparatively short, the apex somewhat acuminate, and the outer margin distinctly convex; on the other hand, where the blue shot is confined to the basal two-thirds, the costa is longer, the apex rounded, and the exterior margin straighter, sometimes even somewhat emarginate; this latter form was, owing to the wording of the original description, redescribed as *E. adamsoni*,* Marshall, (Journ. A. S. B., vol. xlix, part ii, p. 245, 1880). It is possible that the two forms may still be distinct, but numerous intermediate varieties occur, and we are unable to separate them.

Euplexa margarita has as yet been found only in Tenasserim and the Mergui archipelago, where Dr. J. Anderson took it somewhat commonly in the cold weather. Captain C. H. E. Adamson took a single male at Moulmein in the autumn; another male was subsequently taken at the Mayla Choung in September; numerous specimens were taken by Captain C. T. Bingham in the Thoungyeen forests in December; and again in June by Captain Adamson near Moulmein. The FEMALE differs from the male in the absence of the usual sexual marks, namely the silky stripe on the forewing and the yellowish-white patch on the hindwing; the sexual mark on the forewing is however replaced on the underside by a lengthened violet streak in the position of the mark in the male; also in having the inner margin of the forewing straight, not convex, and the submarginal series of spots on the hindwing considerably larger and more elongate, the spots in and around the cell are also more prominent.

The next three species, *E. crassa*, *E. erichsonii*, and *E. masoni*, are also very closely allied; typical specimens of each are easily separable, but numerous intermediate forms occur, and all three are found in the same localities. It is probable that they are all merely varieties of one species, *E. erichsoni*; the extent to which the submarginal series is continued towards the

* *Euplexa adamsoni*, Marshall. HABITAT: Moulmein. EXPANSE. 3'6 to 4 inches. DESCRIPTION: MALE; Allied to *E. superba*, Herbst, but differing on the UPSIDE of the forewing in that the brilliant blue gloss is confined to the basal two-thirds not reaching to the costa or the inner margin, and that the spots are reduced to four in number, all very small, one subcostal above the end of the cell, and one at the end of the cell, both lilac; and two near anal angle, one marginal, the other submarginal, white. Hindwing as in *E. superba*.

hinder angle, the spots when present of the discal series, and the intensity of the blue shot when present, are all extremely variable. In all three the great breadth of the wings, the comparative shortness of the forewing, and the extremely convex inner margin of that wing in the males distinguishes them from other species of *Salpinx*, and the enlargement of the third and adjacent spots in the submarginal series is also a very distinctive feature which is found in no other species of *Euploea* in this country, except in *E. (Crastina) bremeri* and *E. vermiculata* to a lesser degree; the enlargement of the third spot in the discal series of *E. (Salpinx) illustris* indicates an affinity with this group.

41. *Euploea crassa*, Butler.

E. crassa, Butler, Proc. Zool. Soc. Lond., 1866, p. 275, n. 31; *Salpinx crassa*, Moore, id., 1878, p. 822.

HABITAT: Burma, Siam.

EXPANSE: ♂, 3.6 to 4.0; ♀, 3.5 to 4.1 inches.

DESCRIPTION: "UPPERSIDE coppery-olivaceous, slightly swarthy, and shot with blue at the base; forewing with the apex very acute, with two rows of white submarginal spots, the inner row rather large towards the apex, and violet-white; with three discal dots behind the extremity of the cell, and one costal spot, violet-white. Hindwing, with the costa white, two series of white spots, the inner row towards the apex a little the larger. The body swarthy, abdomen bluish, and the head spotted with ochreous. UNDERSIDE, paler; forewing with two series of spots, the inner apical, the outer continued; one large internal spot, one costal, and often two behind the end of the cell, roseate-white. Hindwing with two submarginal rows of spots, and dotted with white at the base; abdomen ashy, spotted with white in the middle." (Butler, l. c.)

E. crassa, as we identify it, occurs in Rangoon in June; and a number of specimens were taken by Limborg in Upper Tenasserim in the cold weather. Three of these latter specimens, now in the Indian Museum, Calcutta, have the submarginal row of spots on the upperside of the forewing complete, but one of them shows indistinct traces of a discal series. Of five males and four females taken by Dr. J. Anderson in the Mergui archipelago in the cold weather, three males and one female shew traces of a discal series of spots. See remarks on the following species, *F. erichsonii*.

42. *Euploea erichsonii*, Felder.

E. erichsonii, Felder, Reise Nov., Lep., vol. II, p. 324, n. 444 (1865).

HABITAT: Eastern Himalayas, Cachar, Burma.

EXPANSE: 3.6 to 4.2 inches.

DESCRIPTION: "MALE:—The cilia striolated with white. UPPERSIDE, dilute bronzed or rufescent-swarthy, the basal half deeper coloured and slightly tinted with violet in certain lights. Forewing with a short interior silky streak; eight submarginal spots in a row slightly bent towards the costa, opalescent-white, dotted with violet round the edge, enclosing a small white spot; the three upper ones larger than the others, increasing in size from the costa, and placed very close together; the remainder decreasing in size. A marginal row of small white spots placed in pairs between the nervules; sometimes also two narrow violet-white spots outside the end of the cell. Hindwing pale anteriorly, the costal margin pearly-white, with two white spots; also eight small external decreasing spots, and a marginal row of smaller spots, all white. UNDERSIDE, paler, with the submarginal spots as above, but whiter. Forewing, with the depressed internal spot, a subcostal spot, another median rather large, sometimes a third above it, and two small ones beyond the cell, lilac-white; the submarginal spots much smaller than on the upperside, dot-shaped, and white. Hindwing, with white spots at the base; the two upper of the external spots smaller than on the upperside, and one above these dot-shaped; the remainder larger than on the upperside, and whiter. FEMALE: UPPERSIDE, paler than in the male, the markings similar, often indeed larger (the lower submarginal ones sometimes entirely absent or evanescent), but the marginal spots are sometimes dot-like. Forewing, with an obsolete subcostal spot, violet." (Felder, l. c.)

This species has been considered and most probably is identical with *E. crassa*; we republish both original descriptions, as there are two distinct forms—the one with no discal spots and the submarginal row complete on *forewing*, the other with a discal row, and the submarginal series incomplete; but among the numerous specimens in the Indian Museum, and in our collections, there are no less than eight which have the submarginal series abbreviated, and the discal series wanting; and it is impossible to say to which of the two species, if distinct, these specimens should be referred; probably, they are really all one species which will stand as *E. erichsoni*, Felder. The form we identify as *E. erichsoni* is common in the neighbourhood of Moulmein in the autumn. Captain C. H. E. Adamson has sent us a specimen taken in June, in that locality, and we have one specimen taken at Rangoon in June, and Captain C. T. Bingham has taken it in the Meplay valley in February, and in the Thoungyeen forests in May. In the Indian Museum, Calcutta, there are four males and two females taken by Limborg in Upper Tenasserim in the cold weather, and one female from Cachar taken by Mr. Wood-Mason in April.

43 *Eupleea masoni*, Moore.

Salpinx masoni, Moore, Proc. Zool. Soc. Lond., 1878, p. 823.

HABITAT: Upper Tenasserim; Taoo, 3,000 to 5,000 feet; above Ahsown.

EXPANSE: 3·25 to 4·2 inches.

DESCRIPTION: "MALE.—Allied to *E. crassa*, Butler, but differing in its darker colour, in the basal area of the *forewing* being bright glossy blue, and the marginal spots on this wing confined more to the apex. *Hindwing*, less convex along the exterior margin, otherwise similarly marked. From *E. klugii*, Moore, this species may be distinguished by the blue gloss being confined to the basal area, whereas in *E. klugii* it is more brilliant, and suffuses the entire wing" (Moore, l.c.) The prominence of the two rows of marginal spots on the *hindwing* in this species, as well as the breadth of the wings, distinguish it from *E. illustris*.

E. masoni has been taken only in Tenasserim, where it is not uncommon, though less so than either of the others. The specimens in our collections, which accord well with this description, are barely if at all separable from *E. erichsoni*.

44. *Eupleea klugii*, Moore.

E. klugii, Moore, Horsfield and Moore, Cat. Lep. E. I. C., vol. 1, p. 130, n. 258 (1857).

HABITAT: N. India, Bhutan, Cachar, Sylhet, Upper Burma.

EXPANSE: 3·0 to 4·1 inches.

DESCRIPTION: "MALE: UPSIDE deep brown, having on the *forewing* a brilliant blue gloss, a submarginal row of small bluish-white spots, and an inner parallel row of larger spots, also a bluish spot on costal margin; one within discoidal cell; two linear bluish marks, one between each discoidal nervule; and a rather indistinct bluish mark between the submedian and median nervures. *Hindwing* paler brown, darkest and glossed with blue in the middle; a submarginal row of white spots and a short inner row from anterior margin; also a patch of creamy-white near middle of the wing. UNDERSIDE brown. *Forewing* with the two rows of white spots smaller; one spot on costal margin, one small narrow spot between second discoidal and first [? third] median nervules, and a larger spot between second and third [? first] median nervules; a creamy-white patch on posterior base of the wing. *Hindwing*, with two rows of white spots. FEMALE: UPSIDE nearly as in male. *Forewing*, with the submarginal row of spots obsolete. *Hindwing*, pale brown, darkest and slightly glossed with blue in the middle; two white spots only of inner row distinct, the rest of two rows indistinct; without the creamy-white patch. UNDERSIDE, nearly as in male, but not having the creamy-white patch. Shape of wings as in *Eupleea superba*, Herbst." (Moore, l.c.)

This is a very variable species. The blue gloss is much deeper and more brilliant in some specimens than in others, and in one male and three females from Cachar, and one female from Sylhet, it only reaches to midway between the disco-cellular nervules and the submarginal series of spots, and moreover the gloss is not at all vivid even where present. In some examples, taken by the Yunnan Expedition, probably in Upper Burma, the marginal series of dots on the forewing is entirely wanting; in Cachar and Sylhet specimens this series is sometimes confined to six or seven spots towards the hinder angle, in others it is complete to the apex; the submarginal series is also equally inconstant; in some specimens there are only five spots, in others the series is complete. These spots also differ in size and colour—some are small, equal-sized, round and white others are large, elongated, unequal-sized and violet, some specimens have a very prominent cell spot and a discal series of four spots, others again are without all these spots. The two marginal series of spots on the hindwing are also very inconstant; in some examples they are quite obsolete, in others as prominent as in *E. superba*. The underside is also as diversely marked as the upperside, but it seems clear even from the specimens in the Museum that all these are but casual variations of the same species.

Mr Wood-Mason met with this species commonly in Cachar from April to June; and Mr. A. O. Hume took it in the eastern hills of Manipur in May.

45. *Euploia grantii*, Butler.

Salpinctes grantii, Butler, Trans. Ent. Soc. Lond., 1879, p. 2

HABITAT: Cachar.

EXPANSE: 3.92 inches.

DESCRIPTION: "FEMALE: Forewing above rich piceous brown, shot with purple, darkest in the centre, and palest at external angle, a small white subcostal spot just above the end of the cell, a crescent-shaped lilac spot in the cell, a circular spot on the first median interspace, two fusiform spots beyond the cell, and a series of seven spots, the sixth pyriform, parallel to the outer margin; all these spots lilac with white centres; an ill-defined lilac spot on the second median interspace, a submarginal series of eight white dots between the lower radial and the external angle. Hindwing piceous brown, faintly shot with purple, the costal and external areas broadly paler, two series of pale brown spots parallel to the outer margin, the first of the inner series white-centred, costal border whitish. UNDERSIDE olive brown. Forewing with the median area suffused with piceous, inner border whitish, a pinky-white subcostal spot, and three in an increasing oblique series above each of the median nervules; three or four scattered white dots in an interrupted discal series parallel to the outer margin, and six rather larger white dots in a submarginal series between the lower radial and the external angle. Hindwing with several white dots at the base, a discal series of ten white spots, the upper three rounded, in an oblique subapical series, the remainder rather elongated and parallel to the outer margin, nine white submarginal dots between the radial and the anal angle."

"This species may readily be distinguished from *E. splendens*, ♀ [= *E. rogenhoferi*] by the greater width, and less brilliant purple (not blue) shot of the forewing; also in the more numerous submarginal spots of the forewing, the inner series being, moreover, larger and lilac, whereas in *S. splendens* [= *E. rogenhoferi*] they are pure white, with pale violet borders; the discoidal spot not present on the underside, but an additional spot beyond the cell, the outer spots smaller; no lilac dots beyond the cell of hindwing" (Butler, l.c.)

From the description this species seems nearest allied to *E. klugii*. Out of a very long series of this latter species in the Indian Museum, Calcutta, we are able to pick out individual specimens that agree with the description of *E. grantii*, but we are unable to separate these specimens from *E. klugii*, which is one of the most variable of *Euploia*s. It appears to us that *E. grantii* is only one of the numerous varieties of *E. klugii*, but we have retained the original description of it as a reference to the type alone can settle the question whether it is a distinct species or not.

46 *Euplexa illustris*, Butler.*Salpinctes illustris*, Butler, Journ. Linn. Soc., Zoology, vol. xiv, p. 394, n. 36 (1878)

HABITAT. Sylhet

EXPANSE: 3.9 inches.

DESCRIPTION MALE "Nearly allied to *E. klugii*, Moore, but the outer border of the forewing deep chocolate-brown not covered by the blue shot, and with the white spots upon it smaller, the discal series of spots abbreviated, not extending below the inferior discoidal interspace, the third spot in the series considerably larger" (Butler, l. c.)

This appears to be a very distinct species from either of the two foregoing, though it may ultimately prove to be only a variety of *E. klugii*, and it seems to be rare. The Indian Museum, Calcutta, possesses a single male specimen, the female is as yet unknown.

Two allied species, *Euplexa chloë*,* Guérin, and *Euplexa aegyptus*,† Butler, occur in the Malay peninsula, &c.

47 *Euplexa sinhalæ*, Moore. (PLATE VII, FIG. 12 ♂ ♀).

E. sinhalæ, Moore, Ann. and Mag. Nat. Hist., fourth series, vol. xx, p. 45 (1877). *Isamia sinhalæ*, Moore, Lep. Cey., p. 10, pl. v, fig. 1 (1880), male.

HABITAT. Sikkim, Calcutta, South India, Ceylon

EXPANSE 3.3 to 4.3 inches.

DESCRIPTION "MALE UPPERSIDE dark velvety olive brown, external margins paler. Forewing with a short broad oval sericeous streak between the lower median and submedian veins, a submarginal row of small ochreous white spots, and marginal lower row of minute spots. Hindwing with a broad flesh coloured discoidal patch; costal border broadly cinereous, a submarginal series of oval ochreous white spots, and marginal series of small round spots. UNDERSIDE paler olive brown throughout. Forewing with hind margin broadly cinereous; the sexual mark dusky, a curved discal series of whitish spots near the cell, both wings with a submarginal and marginal series of spots as above. Body black, thorax, head, palpi and forelegs white spotted" (Moore, Lep. Ceylon, p. 10). The FEMALE differs from the male in the absence of the sexual brand, and the inner margin of the forewing being straight,

* *Euplexa chloë*, Guérin. HABITAT. Penang Malacca Johore, Sumatra. EXPANSE. Male, 3.5 inches. DESCRIPTION "Wings entire swarthy. Forewing shining violet at the base (in certain positions), both wings on both sides with white marginal spots arranged in a double series. UNDERSIDE with discal spots white and tinted with violet.

"Intermediate between *E. alcinous* and *F. corita* of Godart. UPPERSIDE both wings blackish brown with a beautiful vivid violet blue reflection, occupying the greater part of the forewing from the base to just beyond the middle (in the male the only sex that we have seen). The forewing has on the UPPERSIDE near the costa and beyond the middle two small scarcely visible bluish streaks and near the apex four white spots. Also on the external border a row of white dots starting from the internal angle and not reaching the apex. Hindwing on both sides with two rows of white spots on the hinder border, of which the interior are rather oblong on the upperside it has also at the middle and near the costal margin a large triangular well defined patch of dingy white. UNDERSIDE of both wings of a glistering brown. Forewing with the same marks and spots as on the upperside but a little larger, the two little streaks near the costa are much more prominent and whiter. Beyond the four spots near the apex there are three others very small, linear forming a parallel band in the line of the margin, two white spots encircled with violet in the middle, below which is a rather large oblong white spot. UNDERSIDE of the hindwing has besides the two rows of white spots on the border seven small violet white marks, and some small white dots at the base. Cilia alternately black and white. Body and head black, spotted with white" (Guérin in Delessert. Souv. Voy. d. l'Inde, pt. ii, p. 71, 1843).

† *Euplexa aegyptus*, Butler. HABITAT. Singapore Sumatra Borneo. EXPANSE. Male, 4 inches. DESCRIPTION "MALE. Wings elongate, swarthy on upperside. Forewing with a short shining discal streak, five white subapical spots, and one indistinct rosy subcostal spot, two minute costal streaks. Hindwing with two submarginal rows of white, sometimes indistinct dots, the costal margin white. Body swarthy, forepart blackish and spotted with white; antennæ black. UNDERSIDE, olivaceous-fuscous. Forewing with the inner margin white, with the costal streak and white subapical spots as on upperside with a series of much interrupted marginal dots, and one submarginal spot at the anal angle, one discal spot, one in the cell, and a discal band with an only appearance. Hindwing with two submarginal series of white spots, the inner series short, an arched discal series of violet dots and one dot in the cell. Body with the thorax black spotted with white; antennæ black; abdomen swarthy, banded with white" (Butler, Proc. Zool. Soc. Lond. 1866, p. 277, n. 25). Distant remarks (Rhop. Malay., p. 22). "Butler gives another species, *E. aegyptus*, as having been received from Singapore. That Singapore specimen, however, no longer remains in the National collection under that name, and was probably so recorded in error.

not lobed; also in the absence of the flesh-coloured patch on the hindwing. The ochreous-white markings are also more prominent.

In Indian specimens on the forewing the spots of the submarginal row increase from the costa to the first median nervule, and the next interspace below contains two small adjoining spots; the marginal series is also complete in many specimens to the apex. A male specimen taken by Mr. Otto Möller in the Sikkim tarai in August has the upperside of the forewing very perceptibly shot with blue; the marginal rows of spots on both wings smaller, especially the submarginal series on the forewing, the spot below the third median nervule in that series being obsolete.

This species on the upperside bears a very close resemblance to *E. core*, except in outline of the forewing, and the flesh-coloured patch on the hindwing, which latter is concealed by the inner margin of the forewing. On the underside it may be readily distinguished by the absence of the spot in the cell of both wings, which are invariably present in *E. core*. The apex of the forewing is more acuminate, and the inner margin much more convex; both wings are wider and more ample than in *E. core*.

Our collections contain specimens taken at Trevandrum in July by Mr. H. S. Ferguson, at Calicut in September, in the Wynad by Mr. Rhodes Morgan, and from Bhadrachullam taken by Mr. W. T. Blanford. In the neighbourhood of Calcutta Mr. de Niceville has found it common throughout the year. In Ceylon it has been "taken at Galle and Kandy by Captain Wade."

The figure shows the upperside of both sexes—the male on the left, the female on the right, from specimens in the Indian Museum, taken near Calcutta.

The next three species, *E. vestigiata*, *E. novaria*, and *E. leucogonyx*, and also *E. eunice* from Java, are closely allied. The true *E. eunice* inhabits Java, and, according to the original description, has only a submarginal row of violet spots, one subcostal, and one interno-median spot on the forewing, the Continental race from Burma and Malacca, which is referred to as *E. vestigiata*, further differs from the Javan species in having, in addition, numerous spots on the disc of the forewing, and an incomplete marginal series from the hinder angles of both wings; but the extent to which these markings are developed differs so greatly in individuals, even from the same locality, that the Continental race can hardly be separated with propriety. The Nicobar race agrees with the true *E. eunice* from Java in the absence of the marginal series from both wings, but it has the spots on the disc even more largely developed than in the Continental race. It is as yet a rare insect, and we have never seen a specimen, and it is possible that when more specimens have been observed, this race may also be found to vary as much as the Continental race does, in fact "Felder clearly defines this variability in his description;" in the meantime, as the Nicobar form may be peculiar, we have retained it as distinct under the name *E. novaria* given to it by Felder. All these races have the wings shot with brilliant blue in both sexes.

48. *Euplea vestigiata*, Butler.

E. vestigiata, Butler, Proc. Zool. Soc. Lond., 1866, p. 288, n. 58, fig. 1, female. *Caliphlea vestigiata*, Butler, Trans. Linn. Soc., Zoology, second series, vol. 1, p. 535, n. 2 (1876). *Euplea vestigiata*, Distant, Rhop. Malay, p. 26, pl. iii, fig. 6 male, 7 female (1882).

HABITAT: Upper Tenasserim, Penang, Malacca, Sumatra and Java.

EXPANSE: 3.5 to 3.9 inches.

DESCRIPTION: MALE: UPSIDE.—Forewing uniform velvety blackish-brown (scarcely perceptibly paler at hinder angle), shot throughout with deep but brilliant blue; with a submarginal series of prominent violet spots, a subcostal spot above end of the cell, and a broad short streak of violet below the first median nervule. In one specimen the submarginal row is incomplete, only four spots being present on the apical half, but in all the other specimens examined the row is complete, and prominent as far as the first median nervule; in addition to these markings some specimens show a few small round marginal dots towards the hinder angle, some have two short discal streaks below the discoidal nervules, some have a short streak

above the interno-median streak, and others have a short streak below it; all these spots and streaks being violet. *Hindwing* paler brown, suffused darker and slightly tinted with blue on and about the median nervule; the costal area hoary, a large ochreous patch about the subcostal nervure covering the upper half of the cell, and extending above it; a submarginal decreasing row of three or four violet spots from the costa (almost obsolete in one specimen), and a few marginal dots from anal angle; in one specimen the submarginal row is complete to anal angle. *UNDERSIDE* paler brown, with the spots paler violet, almost white. *Forewing* with the interno-median area cinereous, the streak of the upperside visible as a raised con-colourous mark; a conspicuous broad oval whitish patch above the first median nervule, two discal streaks sometimes prominent, sometimes obsolete, a subcostal violet spot; the submarginal row much smaller than on upperside and partially obsolete in one specimen; and a marginal row of small prominent dots, usually complete, but partially obsolete, in one specimen. *Hindwing* with a decreasing submarginal row of round whitish spots from the costa to anal angle; and a corresponding row of rounded marginal dots from anal angle not quite reaching the apex. The usual basal white dots, but no spots on the disc of the hindwing, and none in the cell of either wing, on upper or underside. The *FEMALE* differs from the male on the *UPPERSIDE* in having the submarginal spots of the *forewing* prominently centred with white; also in having the inner margin straight, not bowed out as in the male, and on the *hindwing* in the absence of the subcostal ochreous patch. On the *UNDERSIDE* the *forewing* is similar, except that the internal cinereous area does not nearly reach the median nervule, and the raised sexual streak is absent; on the *hindwing* the marginal and submarginal spots are rather more prominent. One female, evidently aberrant, has a conspicuous geminate violet spot at end of the cell in the forewing.

Notwithstanding that Butler in his original description of this species * omits all mention of the brilliant blue spot, it is clear from Distant's description in his "*Rhopalocera Malayana*," written after examination of the type, that the species here described is *E. vestigiata*, Butler. Neither Butler nor Distant refer in their descriptions to *E. eunice*, Godart, from Java, of which the present species appears to us to be only the continental form. Distant remarks that *E. vestigiata* "appears to be a variable species [of this there can be no doubt], and is probably a race of the *E. novara*, Felder. Felder clearly defines this variability in his description; in fact, with the qualifications he there admits in the markings of several varieties, the Province Wellesley specimens might almost be considered as agreeing with some of his Nicobar types. This Malay form somewhat differs from Javan specimens of *E. vestigiata*, which Mr. Kirby was probably correct in considering a variety of Felder's species."

Numerous specimens of this species were taken by Captain C. H. E. Adamson, near Moulmein, on 12th June; and a single male was taken at the Maylachoung, by Captain C. T. Bingham, on the 24th September; but it is a rare Butterfly, and has not hitherto been recorded as occurring within Indian limits.

49. *Euploea novara*, Felder.

E. novara, Felder, Verh. zool.-bot. Gesellsch. Wien, vol. xii, p. 482, n. 108 (1869); Reise Nov., Lep., vol. ii, p. 317, n. 430, pl. xxxix, fig. 7 (1865), male.

HABITAT: Kar Nicobar.

EXpanse: 4.1 inches.

**Euploea vestigiata*, Butler. *HABITAT*: Malacca, Sumatra, Java. *EXpanse*: Male, 3.55; female 3.4 inches. *DESCRIPTION*: "*Forewing* above blackish-swarthy, the margin slightly rufous, with eight or nine submarginal spots, one costal spot, and a short internal discal streak, violet. *Hindwing* olivaceous-swarthy, deeper in the middle; with the costal margin whitish, with three subapical white spots; the male with a rather large subtriangular ochreous spot placed near the costa. *Body* blackish-swarthy, spotted with white in front; the antennæ black. *UNDERSIDE* olivaceous, with the interior margin ochreous-white; in the male with six submarginal dots, nine marginal, and one rather large oval discal spot, white; one oval discal internal spot ashy; one small costal spot and two discal placed behind the cell, violet-white. *Forewing of the female* with nine submarginal spots, four subanal dots, two minute subapical dots, and one large oval discal spot, white; one costal spot violet-white. *Hindwing* with ten submarginal spots, and nine or ten anal marginal spots, white, two elongated discal dots between the subcostal nervules, violet-white. *Body*, with the thorax black, spotted with white, the abdomen ashy-fuscon, the antennæ black." (Butler, l'ro. Zool. Soc. Lond., 1866, p. 288, n. 38, fig. 1, female).

DESCRIPTION : "MALE, with the *cilia* marked with white *Forewing* above blackish chestnut, deeply suffused with violet blue in certain lights, with a subcostal spot, two behind the cell (sometimes entirely wanting), three median elongated (the first sometimes wanting, the third minute, and the middle one large and powdered with white), and seven to nine others submarginal of different shapes, pale violet blue. *Hindwing* pale silky fuscous, towards the base almost as in the forewing, the anterior margin silky white, with two white spots, the surface with the usual shelly appearance; two or three decreasing spots, violet encircled with swarthy **UNDERSIDE** pale rufescent fuscous, with white basal spots. *Forewing*, with a subcostal spot, two beyond the cell, four large interior, a bent submarginal dot-shaped series often interrupted, and a marginal series of minute spots. *Hindwing*, with some very small external spots, and others before the hinder margin violet blue, more or less powdered with white, and ringed with swarthy *Forewing*, with the internal area as usual. A beautiful local form of the Javan *E. eunice*." (Felder, 1 c.)

This is a very rare insect, and we have never seen a specimen.

50 *Euplex leucogonys*, Butler.

Salpinx leucogonys, Butler, Trans Linn Soc Lond, Zoology, second series, vol i, p 336, pl lxviii, fig. 3 (1876), female.

HABITAT : Nepal (?) Assam (?) Malacca.

EXPANSE : 3·2 inches.

DESCRIPTION FEMALE. "Nearly allied to *E. zestigiata*, Butler, but smaller; the costa of *forewing* not so strongly arched, the outer margin slightly inarched in the centre, the submarginal spot on second median nervule wanting, the subcostal spot above the end of the cell much smaller, the spot on interno-median area widened into a notched blotch, all the spots lilac *Hindwing* paler, only three lilacine whitish spots placed obliquely near apex; no submarginal spots; anal angle white **UNDERSIDE :** *Forewing*, with only two or three submarginal and three or four marginal white dots *Hindwing*, with no white blotches beyond the cell" (Butler, 1 c.) The figure shews on the *hindwing* three white submarginal spots one in each interspace above the discoidal nervule, and five large violet-white spots on the margin at the anal angle. Distant remarks (Klu p Malay, p 27, note) — "Butler's figure is somewhat misleading, the marginal spots to hindwing having been enlarged and exaggerated by the artist compared with those on the type specimen in the British Museum which I have examined." Mr. Distant considers *E. leucogonys* as merely a small variety of *E. zestigiata*.

This also appears to be a rare insect, and we have never seen a specimen; its occurrence in "Nepal and Assam" must be considered doubtful pending further evidence; it belongs to a Malayan group.

51. *Euplex rhadamanthus*, Fabricius. (PLATE VII, FIG 11 ♂ ♀).

Papilio rhadamanthus, Fabricius, Ent Syst, vol iii, pt 1, p 49, n 137 (1793) *Trepachrois thebes*, Hübn., Samml. Ex Schmett (1806-1824) *Danaus alcidice et rhadama*, Godart Enc Meth, vol ix, p. 180, no 13, 14 (1819) *Salpinx rhadamanthus*, Moore, Proc Zool. Soc Lond., 1878, p 822.

HABITAT : Eastern Himalayas and Burma.

EXPANSE : 3·0 to 3·8 inches.

DESCRIPTION : MALE : *Forewing* black, tinged with brown at the base, and shot throughout with deep violet blue, brightest towards the exterior margin; a broad bar of white from the costa almost to the median nervure, cut into four irregular parts by the black costal and subcostal nervures; below this and outside the cell is a white spot of variable size between the second and third branches of the median nervure; this spot is sometimes altogether wanting, and in some cases a second white spot appears between the first and second median nervules.

Below the first median nervule is an oval longitudinal violet spot; four submarginal spots near the apex, and a larger one between the first and second median nervules, violet, often white centred; a few minute marginal dots near the anal angle, also violet. *hindwing* with four white streaks from the base below the cell, followed by a short white dash tipped with violet, a whitish patch near the base cut by the subcostal nervule; the rest of the costal area rather pale silky brown; the exterior half black, shot with deep violet blue. Two small violet spots just beyond the end of the cell, two submarginal spots beyond these, and two more near the anal angle, and a few minute marginal dots (sometimes entirely wanting) from anal angle, also violet. **UNDERSIDE** brown, markings similar to those of the upperside, but whiter. In the *forewing* the second spot below the white patch, which is usually wanting on the upperside, is large and conspicuous on the underside; the submarginal spots are white, and the marginal series, which are violet, are more complete than on the upperside, especially towards the apex. In the *hindwing*, the whitish subcostal patch is wanting, and in addition to the white streaks below the cell there are three white streaks in the cell, the upper one short, sometimes divided, the middle one longer and narrow, the lower the broadest and longest, a series of five streaks outside the cell.

The above description is taken from a large series of specimens collected in Upper Tenasserim, by Captain C. T. Bingham, and from a few collected in the Khasi hills by Mr. J. P. Cock. In specimens from Sikkim, in Colonel Lang's collection, the white markings are altogether larger and more prominent than in Burmese specimens. The Sikkim specimens also average a good deal larger; they are paler and browner, especially at the base of the forewing; the white spot outside the cell of forewing, between the second and third median nervules, which is small or wanting in Burman specimens, is large and prominent in those from Sikkim, giving a different character to the white band. The marginal blue spots at anal angle of *forewing* are more numerous, often as many as seven being present, while in Burman specimens usually only two are visible, and apparently four is the maximum. On the *hindwing* all the spots are larger, the submarginal series shows usually six from the anal angle instead of two, and the marginal series has eight or ten, while in Burman specimens these latter are often entirely wanting, always minute, and seldom if ever exceeding six in number.

The **FEMALE** is paler and brown, not black, and shot with blue only on the outer half; all the markings are larger, whiter, and more prominent. In the *hindwing* the cell has also three large white streaks in it, occupying almost the entire area; they are confluent in the specimen figured, leaving only interrupted black streaks between. On the **UPPERSIDE** the costal margin of the *hindwing* is broadly white; the marginal and submarginal spots on both wings are circled with violet, and on the **UNDERSIDE** some are white, some are violet. The sexual spot is of course wanting, though it is replaced in the Sikkim specimen figured by a pale streak of grey scales. A single female sent by Captain Bingham from the Thoungyeen forests in Tenasserim differs from Sikkim females precisely as in the males as far as the white markings are concerned, but in it the blue gloss is scarcely perceptible at all, instead of being brighter as from analogy it should have been.

E. rhadamanthus is very common in north-eastern India, from Sikkim to Tenasserim in hilly tracts at elevations of from 1,000 to 4,000 feet above the sea. In the Khasi hills it is on the wing in the late autumn. In Upper Tenasserim, Captain C. T. Bingham found it common between Meeawuddy and Kunkarit in February, in the Thoungyeen forests in March and April, and in the Donat range in April. The single female specimen referred to above was taken in the Thoungyeen forests in the autumn. Mr. Wood-Mason took numerous males and three females in Cachar from April to August, and Dr. J. Anderson took males only in the Mergui archipelago in the cold weather.

The figure shows the upperside of the male and female from Sikkim specimens in the Indian Museum, Calcutta.

52. *Euplea dioctetianus*, Fabricius.

Papilio dioctetianus, Fabricius, Ent. Syst., vol. iii, pt. i, p. 40, n. 118 (1793); *Danaus dioctetia*, Godart, Enc. Méth., vol. ix, p. 181, n. 16 (1819); *Calliplex dioctetianus*, Butler, Trans. Linn. Soc., Zoology, second series, vol. i, p. 533 (1876); *Euplea dioctetianus*, Distant, Rhop. Malay., p. 28, pl. iv, fig. 4 male, 5 female (1882).

HABITAT: (Nepal, Assam?), Penang, Malacca, Singapore, Siam, Java.

EXPANSION: ♂, 3'4; ♀, 3'1 inches (from Distant's figures).

DESCRIPTION: "Wings entire, black. Forewing with a white interrupted band. Hindwing with some white lines at the base, and a double row of spots of this colour on the margin. Of the size of *D. claudia* [= *Euplexa midamus*] to which it is closely allied; the underside of both wings resembles the upperside. Forewing black, with a white band formed of four large spots, one transverse line of four dots of this colour, and some dots equally white along the margin. Hindwing blackish brown, with some white longitudinal lines towards the base, and two rows of white spots along the margin. The head and thorax are of a deep black, with some white spots; the upperside of the abdomen is blackish, the underside ashy with some very black bands." (Godart, l. c.)

E. dioctetianus has usually been considered as identical with *E. rhodamanthus*, but the absence of all mention of the conspicuous violet blue spot, the pure white character of the markings, and the black colour of the wings, seem to indicate its distinctness from that species in both sexes. We have never seen a specimen, and if it occurs at all in "Nepal and Assam" (which we doubt), it must be extremely rare. It is included in Butler's paper on the Butterflies of Malacca* as *Calliplex dioctetianus*. It is probably a local form of *E. rhodamanthus* developed in the Malay Peninsula. The Tenasserim female of *E. rhodamanthus* shows a decided approach to this species in colouration, but it is small, far smaller than average specimens of *E. midamus*. Distant remarks: "This is evidently a Malay race of *E. rhodamanthus*, a species which I follow Moore and Butler in considering as typically represented in Northern India. It possesses also another and very distinct Bornean race, described as *E. lowii*. The principal difference between these three species or races is that of a gradually increasing melanism, which is least in the North Indian *E. rhodamanthus*, and greatest in the Bornean form *E. lowii*." According to Distant's description the wings in this species are dark indigo-blue, not black.

Second group.—MACROPLEA, Butler.—Mr. Butler has separated this group from the foregoing in the following terms:—"This genus [*Salpinx*, Hubner], is not altogether a satisfactory one; it contains two groups, the one being much like an enormous form of *Calliplex* (I refer to the *S. phanareta* group), the other having a blue or sericeous brand upon the interno-median area; in other respects the species seem nearly allied. I propose to give the first of these groups the subgeneric title of *Macroplea*." (Butler, Journ. Linn. Soc., Zoology, vol. xiv, p. 292 (1878).

This subgroup is only represented by two species within Indian limits, of which one is found in Ceylon, the other, a native of the Malay peninsula, extends into Burma, and has been found in the Nicobar isles. The *Euplexas* of this type are large insects, without the brilliant purple or blue gloss, and usually with three more or less complete rows of marginal and submarginal spots. They differ from the *Salpinx* group only in having no brand on the interno-median area of the forewing of the male, and in their large size; the outer margin of the hindwing in the male too appears as if it had been oiled.

Key to the Indian species of *Macroplea*.

- A. Upperside golden-fusces; forewing with three rows of violet-white spots.
 - a. With the violet-white markings prominent; the three rows on forewing complete.
 - 53 *E. (Macroplea)* CASTLENAVI, Burma, Nicobars.
 - b. With the violet-white markings small; the discal series incomplete.
 - 54 *E. (Macroplea)* ELISA, Ceylon.

* Trans. Linn. Soc., Zoology, second series, vol. i, p. 533 (1876).

53 *Euploea castelnani*, Felder.

E. castelnani, Felder, Reise Nov., Lep., vol. ii, p. 315, n. 427 (1865), female; *E. phabus*, Butler, Proc. Zool. Soc. Lond., 1866, p. 270, n. 3, *Macroploea phabus*, Butler, Journ. Linn. Soc., Zoology, vol. xiv, p. 292 (1878); *E. castelnani*, Distant, Rhop. Malay., p. 24, pl. ii, fig. 6 (1882), female.

HABITAT: Tenasserim, Penang, Nicobars, Java.

EXPANSE: ♂, 4.5 to 5.3; ♀, 4.9 to 5.3 inches.

DESCRIPTION: "*Forewing* elongate. UPPERSIDE golden-fusca, the costa fuscous, and the internal area fuscous; the outer margin with three rows of white submarginal spots, and one spot near end of the cell; the external row composed of small oblong spots; the middle row with spots increasing in size near the costa, and arranged in a curved line; the inner row angulate, with oblong spots increasing in size near the costa. *Hindwing*, purplish, the costal area ochreous-white, and the middle of the cell ochreous [in the MALE], the external and internal areas rufous-swarthy. Of the FEMALE with three continuous rows of rufous-white submarginal spots on the outer margin: of the MALE with three interrupted rows not reaching the anal angle, and the anal angle appears as if oiled. UNDERSIDE, *forewing*, fuscous at base, purplish in the middle in certain positions; the inner margin pale, with a rather large white subanal spot; the outer margin with rows of spots as on the upperside, the two external rows, however, with smaller spots, and the inner row beyond the end of the cell sometimes obsolete, and of larger spots. *Hindwing*, coppery-fusca, the outer margin in the MALE fuscous, with a marginal row of white dots, and three subapical, and an arched series of five violet dots beyond the end of the cell; in the FEMALE with two rows of dots, an inner arched series of seven violet dots, and one near end of the cell. *Body* with the thorax black, spotted with ochreous; *abdomen* ashy; *antennæ* black. This species is quite distinct from *E. phothos*, Godart, being much smaller, of a more golden colour, and quite differently spotted." (Butler, l. c.)

A female, taken by Captain C. H. E. Adamson at Nyounting, near Moulmein, in September, has the whole apical area of the forewing powdered with violet-white, the two inner rows of spots above the third median nervule being almost lost in the ground-colour, which in that part is almost pure white; the spots on both wings are also larger, and more diffused. The inner margin of the forewing is straight, while in the male it is enormously lobed to cover the ochreous patch of scales on the hindwing, which is present in that sex though absent in the female. The female is altogether a much paler insect, especially on the underside, where all the markings are larger than in the male. The spots outside the cell on the underside of many males are eight in number, there being two short parallel streaks between the first median nervule and submedian nervule.

Mr. de Roepstorff has taken two male specimens in the Nicobars. Dr. J. Anderson took one male and seven females in January, also two females in March, in the Mergui archipelago. These female examples are darker than the Moulmein specimen; the three series of spots on the forewing are also distinct, though exhibiting a tendency to coalesce.

54. *Euploea elisa*, Butler. (PLATE VIII, FIG. 14 ♂).

E. elisa, Butler, Proc. Zool. Soc. Lond., 1866, p. 270, n. 4, *Macroploea elisa*, id., Journ. Linn. Soc., Zoology, vol. xiv, p. 292 (1878), id., Moore, Lep. Ceylon, p. 9 pl. v, fig. 2, male, 22, female (1880).

HABITAT: Ceylon.

EXPANSE: ♂, 4.25 to 4.80; ♀, 4.1 to 4.7 inches.

DESCRIPTION: "*Forewing* above golden-fusca, the inner margin fuscous, with three rows of white spots, the inner row short with three spots placed between the median nervules, the outer row not reaching the apex; the middle row in the MALE much interrupted, in the FEMALE continuous, curved near the costa; one spot near the end of the cell. *Hindwing* of the MALE coppery-fusca, the costal area ochreous white, and the middle of the cell ochreous; with three discal spots placed beyond the cell; the outer margin fuscous; the anal margin as if oiled. Of the FEMALE the *Hindwing* is golden-fusca, with the costal margin pale; the outer margin with two submarginal series

of white dots, indistinct at the anal angle; and a series of three spots placed beyond the cell. *Body* swarthy, darker and white-spotted in front; the *antennæ* black. **UNDER-SIDE:** *Forewing* as on upperside, but the spots are larger, and the external submarginal row is continuous in the **MALE**. *Hindwing*, of the **MALE**, paler; on the outer margin with a row of five marginal dots in the middle, and an angulate row of violet dots beyond the end of the cell; some minute white spots at the base. *Hindwing*, of the **FEMALE**, as on upperside, but the internal series beyond the end of the cell has six dots, and one near the end of the cell. *Body* with the *thorax* black, spotted with white; *abdomen* fuscous; *antennæ* black." (Butler, l. c.)

"**LARVA*** purple-brown, with two black-tipped red fleshy filaments on second, two on third, and two on twelfth segments; each segment with transverse black streaks; lateral line purple; head and legs black. **PUPA** thick, broad, purple-grey, fasciated with golden-yellow; abdominal segments black-beaded." (Moore, Lep. Ceylon, p. 10, 1880).

"Taken on low ground at Colombo among hedges round native gardens at any time, but not very common. Of slow heavy flight; settles on leaves, and is easily caught." (Hutchison). "Commonly found at Galle among cocoanut trees and low bushes." (Wade). There is as yet no record of its occurrence except in Ceylon.

The figure is taken from a male specimen from Ceylon in the collection of the Hon'ble F. Mackwood.

Third group.—**CALLIPLEA**, Butler.—"The species of *Calliplea* are all of small size; they have the inner border of the *forewing* in the *males*, strongly developed, and covering a large subcostal yellowish patch upon the *hindwing*; but without any trace of a band on the *interno-median* area of the *forewing*." (Butler, Journ. Linn. Soc., Zoology, vol. xiv, p. 296, 1878).

Only one species of this group has been recorded from India; the exact locality is not stated, but probably it is from the north-eastern corner into which the Malayan fauna extends. It appears to be rare.

Key to the Indian species of *Calliplea*.

A. Costal margin and apical half of *forewing* deep chestnut, shot with violet or blue.

a. With the spots on *forewing* violet-silvery speckled with white, two cellular spots sometimes confluent.

55. *E. (Calliplea) ledereri*, Eastern India.

55. *Euplea ledereri*, Felder.

E. ledereri, Felder, Wien Ent. Mon. Arch., vol. iv, p. 397, n. 14 (1860), id., Reise Nov., Lep., vol. ii, p. 372, n. 437, pl. xl, figs. 5, 6 (1865), *male*; *Euplea inquinata*, Butler, Proc. Zool. Soc. Lond., 1866, p. 288, fig. 2, *male*, p. 291, n. 65; *E. ledereri*, Distant, Rhop. Malay., p. 26, pl. ii, fig. 10 (1882), *male*.

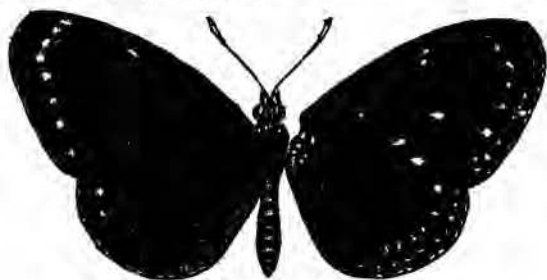
HABITAT: Eastern India, Malacca interior.

EXPANSE: 2.75 to 3 inches.

DESCRIPTION: "**MALE.**—With the *cilia* marked with white. **UPPERSIDE** dilute chestnut-swarthy. *Forewing* with the costal margin and anterior half spread with deep chestnut, and in certain positions shot with violet; with two cellular spots sometimes confluent, two subcostal, a third below the second discoidal nervule sometimes rather larger, a fourth rather large, sub-apical and trifid, and four submarginal, silvery violet more or less powdered with white. *Hindwing* with the border beyond the cell much paler, the costal area silky-hoary with two white spots; the usual discal patch shortened, and well separated from the origin of the discoidal nervure. **UNDERSIDE**, pale shining fuscous. *Forewing* with a subcostal spot, three discal, others external small, and marginal dots. *Hindwing* with external decreasing spots, and rather larger marginal dots, white." (Felder, l. c.)

* Figured on pl. iv, fig. 8; chrysalis, 8a, of Horsfield and Moore's Cat. Lep. E. I. C., vol. i (1857), from drawings of E. L. Layard, as the larva of *E. prestol*.

This species, if it really does occur within Indian limits, is very rare; we have never seen a specimen. Distant remarks that "it appears to be almost confined to the Malay Peninsula, especially if there should be any error in the locality of Assam, as given by Mr. Warwick to the British Museum." It is nearly allied to, and probably is only the continental form of, *Euplea mazares*, Moore, from Java, of which a figure of the upper and underside of a male in the Indian Museum, Calcutta, is given below:—



EUPLEA MAZARES, MOORE.

Fourth Group—TREPSICHOIS, Hubner.—"Forewing elongated, the outer margin subangulated and slightly notched below the apex; the inner margin of the male very slightly convex, without trace of a band, but the hindwing with a small yellowish patch in the cell at the origin of the first subcostal branch." (*Butler, Journ. Linn. Soc., Zoology*, vol. xiv, p. 296, 1878).

The elongated forewing distinguishes this group and the two following from the three which precede. Only a single species of this group is found within Indian limits, and only three others are known which represent the group in the Malay archipelago. The females differ greatly from the males in having the hindwing profusely striped with white. The Indian species extends from Burma through the Himalayas to Kulu, and is the widest spread and commonest of all the *Eupleas* of Northern India, except *E. coti*.

Key to the Indian species of *Trepsichrois*.

A Forewing velvety brown, shot with bright blue, and with bluish white spots on the outer half.

56 E (*Trepsichrois*) MIDAMUS, N India, Burma.

56. *Euplea midamus*, LINNÆUS (PLATE VIII, FIG. 13 ♂ ♀).

Papilio midamus, Linnæus, Mus. Ulr., p. 251, n. 70 (1764), id., Syst. Nat., vol. 1, part 2, p. 765, n. 108 (1767); *Papilio claudin*, Fabricius, Gen. Ins., p. 263 (1777), female; *Danaus midama*, Godart, Enc. Méth., vol. ix, p. 179, n. 12 (1819); *Trepsichrois midamus*, Hubner, Verz. bek. Schmett., p. 16, n. 92 (1816); *Papilio basilista*, Cramer, Pap. Ex., vol. iii, pl. cclxvii fig. C (1780), female; *Euplea midamus*, Distant, Rhop. Malay., p. 94, pl. 11, fig. 8 male, ♀ female (1882).

HABITAT: N.-W. Himalayas to Burma.

EXPANSE: ♂, 3.0 to 4.2; ♀, 3.5 to 4.6 inches.

DESCRIPTION: MALE: UPPERSIDE, forewing deep velvety blackish-brown, glossed with brilliant blue, brightest on the apical half, where it forms in some lights a large patch of this colour. The basal half spotless, the outer half with numerous pale blue spots, powdered and often centred with white, and arranged as follows:—A marginal row of small spots, regular, two between each pair of nervules, decreasing towards and seldom reaching the apex; a submarginal row of larger spots, irregular, one between each pair of nervules; a discal row, very irregular, of seven spots, and angled at two points, commencing with a small costal spot, and ending with an oblong interno-median spot; and one spot in the cell near the end. Hindwing velvety brown, the costal area ashy testaceous, with a small yellowish patch within the cell at origin of first subcostal nervule, otherwise entirely unspotted, though occasionally

a faint trace of an obsolete marginal row is visible. There is also a large patch of lengthened, plush-like, modified scales somewhat lighter coloured than the ground, filling the upper and outer two-thirds of the cell, and extending beyond it almost to the outer margin, bounded posteriorly by the third median nervule and extending to above the first subcostal branch. This patch of scales, together with the small yellowish patch also within and nearer the base of the cell is peculiar to this group of *Euplaas*. **UNDERSIDE**, paler brown. **Forewing**, with the interno-marginal area broadly tinged with ashy, and showing a broad whitish streak near base, almost covered by the hindwing. Spots as on upperside, but violet-white, smaller, and the oblong interno-median spot which terminates the discal row is wanting on the underside. **Hindwing** with a marginal row of two spots between each pair of nervules, from anal angle not usually reaching the apex; a submarginal similar row from apex, incomplete towards the anal angle, a spot in the cell at the end, and three or four small streaks arranged outside it on the disc, violet-white; the *costa* spotted with white on both wings.

The above description is from specimens from Shillong, which are of large size; the specimens from Upper Tenasserim are much smaller, and on the underside the spots are all smaller; many of them, especially on the hindwing are completely wanting, and where present are very minute. In some Sikkim specimens also the spots are similarly small and more or less wanting on the underside. On the underside of the *abdomen* there are six transverse bands of lilac white in Shillong and Sikkim specimens, while in the Tenasserim specimens there are seldom more than three. **♂ MALE** Brown, darkest towards the apex of forewing, and much streaked with white, especially on the hindwing. **Forewing** with a large patch on outer half shot with bright blue; the spots as in the male, but except on the blue-shot patch the spots are pure white, from the base of the wing a faint brownish-white streak in the cell, and a longer and whiter streak (sometimes double) in the interno median area, confluent with the last spot of the discal series. **Hindwing** with a row of rounded marginal spot, a submarginal row of white streaks, two between each pair of nervules, short at the apex, but towards the anal angle extended right up to the base of the wing; a discal series longest at the costa, and three or four streaks in the cell, all white. **UNDERSIDE** as on upperside, but the streaks from base of *forewing* broader, more prominent and purer white, some of the spots and streaks on the outer half of both wings tinted faintly with blue. The specimens from Tenasserim, as do the males, are generally smaller in size than those from Shillong.

LARVA—Ground-colour testaceous, marked with crimson and black perpendicular lines on the segments, a spiracular row of black spots and some yellow blotches just above the legs. The face is also marked with crimson and black, legs red, the third, fourth, fifth, and twelfth segments have each a pair of very long tentacula springing from the subdorsal region, and standing almost upright over the body, the lower portion of these processes is crimson, the upper black. Figure 10 of Plate IV, of Horsfield and Moore's Cat Lep E. I. C. (1857), from Java, where it "feeds on a species of *Surur*, December." Also Plate III, fig 10, caterpillar, and 10a, chrysalis, of Horsfield's Cat Lep E. I. C. (1829). **PUPA**, Figure 10a.—Castaneous, beautifully marked with gold.

E. mudamus s., with the exception of *E. core*, the commonest and most widely spread of all the *Euplaas* of north India, but, except in the far east it is only found in the warm valleys of mountainous regions. It extends from Tenasserim as far west as Kulu, where Mr. A. Graham Young has taken a single specimen. Mr. de Nicéville also took a single worn female at Kalka, Punjab, in October. A single specimen was taken by Colonel Lang, at Sitapur, in Oudh, but its occurrence in the plains of Oudh must be very exceptional. In Kumaon it is found, but rarely, in the warm valleys in the rains. In Nepal it seems to be common near Khatmandu, as Dr Scully brought down numerous specimens. Mr de Nicéville has taken it commonly in the Sikkim tarai, and below Darjiling in the autumn. In the Khasi Hills it is common in the autumn and cold weather. Mr. Wood-Mason found it abundant in Cachar throughout the hot weather. Dr J Anderson also took numerous specimens in the Mergui archipelago throughout the cold months; and in Upper Tenasserim Captain Bingham found it common in the Thoungyen forests in March and April.

Butler records *E. mulciber* as a distinct species, occurring with *E. midamus* at Malacca. Cramer's figure of *E. mulciber*, however, is almost identical with the common *E. midamus* of North-East India. *E. mulciber* is figured by Distant (Rhop. Malay., pl. iii, fig. 1 male, 2 female 1882), who never met with it in the Malay Peninsula, and remarks (page 26) that "it has been considered as the constant Bornean race or form of *E. midamus*, and peculiar to that island."

The figure shows the upperside of a male from the Khasi hills, and of a female from Sibsaagar, Assam, both in the Indian Museum, Calcutta.

Fifth Group—*CRASTIA*, *Hübner*.—"Males with more acuminate forewing than in *Trepsichrois*, the inner margin much more convex; no band on the forewing, and no yellowish spot in the cell of the hindwing. Females similar to *Trepsichrois* in form." (*Butler*, Journ. Linn. Soc., Zoology, vol. xiv, p. 297, 1878).

This is a Malayan group; four species are recorded as occurring within Indian limits, one in the Nicobars, the others all in the extreme east on the borders of Malayana. All the species are comparatively rare within Indian limits, and we have no specific record of any being taken, except in Tenasserim and the Nicobars.

Key to the Indian species of *Crastia*.

A. With the wings above spotless black-fuscous, suffused with the deepest violet-blue, bordered externally with paler unglossed fuscous.

57. *E. (Crastia) SIMULATRIX*, Nicobars.

B. Basal three-fourths of forewing glossed with blue, hindwing with two series of small whitish spots.

a. Rufescent swarthy, hindwing not blue glossed, spots small.

58. *E. (Crastia) MODESTA*, Burma.

E. (Crastia) CAMARALZEMAN, Siam.

b. Cupreous brown, hindwing blue glossed, spots larger.

59. *E. (Crastia) CUPREIPENNIS*, Burma.

C. Wings blackish-swarthy, unglossed with blue, forewing with three more or less complete series of white spots.

60. *E. (Crastia) URUMBERI*, Mergui.

E. (Crastia) MALAYICA, Malayana.

57. *Euplea simulatrix*, W.-M. and de N.

E. (Crastia) simulatrix, Wood-Mason and de Niceville, Journ. A. S. B., vol. I, part II, p. 229 (1881), male; idem, id., vol. II, p. 15, pl. III, fig. 1 male, 2 female (1882).

HABITAT: Great Nicobar.

EXPANSE: ♂, 3.7; ♀, 3.18 to 3.86 inches.

DESCRIPTION: "MALE: UPPERSIDE spotless black-fuscous, suffused with the deepest violet-blue, externally tolerably broadly bordered with paler unglossed fuscous. Hindwing with an oval patch of iridescent lighter modified scales, occupying about the second and third fifths of the length of the organ, extending from the middle of the discoidal cell to the middle of the interspace between the costal and subcostal nervures at its widest part, and bounded in front by an indistinct streak of cretaceous white; and with the space in front of this oval patch, and of the apical portion of the first subcostal branch, cinereous. UNDERSIDE lighter and less sombrely coloured, their dark basal portions being distinctly glossed with purple-violet, more broadly bordered with paler fuscous, and marked with prominent spots and streaks. Forewing with eight spots, viz., a subapical series of three dots, the posterior of which is equal to the other two taken together, a somewhat elongated large spot between the first and second median nervures, nearly pure white; a reversed comma-shaped spot near the end of the cell, a rounded one and a short linear streak beyond it, the former between the second and third median nervures, and the latter between the third median nervule and the discoidal nervule, and a subcostal spot on a level with the end of the cell, bluish or violet white; with a streak pointed at both ends in the middle of the interno-median area, and, posterior to this, a similarly shaped

and placed patch divided by the submedian nervure, cretaceous-white, and with the sutural cell behind the whitey-brown patch cinereous and satiny. *Hindwing* with a submarginal series of minute violet-white dots, a cellular spot and a curvilinear series of six just outside it bluish white, in addition to the usual basal dots. FEMALE. Wings above and below all lighter and more broadly bordered externally with paler colour of much the same tint as in *E. camorta*. *Forewing* above with an increasing series of three subapical spots, an elongated subcostal spot, a minute dot near the end of the cell, and a larger one just beyond it near the base of the interspace between the second and third median nervules, all white. *Hindwing* above spotless. UNDERSIDE with the discal spots of both wings, and the subapical ones of the *forewing* larger and more prominent, but with the submarginal series of the *hindwing* incomplete and less distinct, there being only two speck-like representatives of them on one hindwing and three in the other, and with a short linear dash between the submedian nervure and the first median nervule, forming a seventh circumcellular mark, the spots all coloured as in the male. The second and smaller specimen approaches the male in the colour of the upperside, and in the breadth of the pale outer borders, it lacks the seventh circumcellular mark, and has only one indistinct representative of the submarginal series of dots on the underside of the hindwing."

"Appears to be very closely allied to the Javan *E. sepulchralis*, Butler."

"A single male and two female specimens from Great Nicobar. On the upperside, it very closely resembles *E. camorta*, of which it is in all probability a mimic, differing from that species, however, in its rather darker and more sombre hue, and in being devoid of a silky sexual streak, and on the underside in the presence of a submarginal series of dots in the posterior wing." (*Wood-Mason and de Nicville, l. c.*)

58. *Euplea modesta*, Butler.

E. modesta, Butler, *Proc. Zool. Soc. Lond.*, 1866, p. 273, n. 13

HABITAT: Tenasserim (?), Siam

EXPANSE: 3.2 inches

DESCRIPTION. "MALE. UPPERSIDE infuscent swarthy. *Forewing* with the basal area bluish. *Hindwing* with the costal area paler, a rather large fuscous subcostal spot, the outer margin with two rows of ochreous-white submarginal spots, the inner row with elongate spots not reaching the apex. Body rufous swarthy, the head spotted with white. Antennæ black. UNDERSIDE paler. *Forewing* with the outer portion of the internal area ochreous, and the margin broadly ashy, one discal spot, and two dots, one costal, and a spot at the end of the cell, bluish white. *Hindwing* with submarginal spots as above, seven discal spots in an arched series, and a spot at the end of the cell, violet-white, some white dots at the base. Body with the thorax ashy, spotted with white, the abdomen swarthy with elongated ochreous median spots. Antennæ black." (*Butler, l. c.*) FEMALE undescribed. See remarks on the following species, *E. cupreipennis*.

An allied species, *E. camaralseman*,* Butler, is recorded from Siam.

59. *Euplea cupreipennis*, Moore.

Craetia cupreipennis, Moore, *Proc. Zool. Soc. Lond.*, 1878, p. 823

HABITAT: Mergui, Upper Tenasserim.

EXPANSE: 3.13 to 3.60 inches

DESCRIPTION. "Allied to *E. modesta* from Siam. UPPERSIDE cupreous-brown, the outer borders broadly paler. *Forewing* with the basal area blue glossed. *Hindwing* with

* *E. camaralseman*, Butler. HABITAT: Siam. EXPANSE: 4.1 inches. DESCRIPTION. "MALE. UPPERSIDE blackish swarthy. *Forewing* with the basal area ashy with greenish blue, one indistinct white spot below the end of the cell. *Hindwing*, with the costal margin paler in the middle greenish blue with twelve ochreous white marginal spots, and a submarginal anal series. Body blackish swarthy, anteriorly spotted with white, the antennæ black. UNDERSIDE olivaceous. *Forewing* with the basal area fuscous and shot with greenish blue; the internal area paler, and one dot at the end of the cell and three minute anal spots, white. *Hindwing* with submarginal spots as on upperside, five discal spots, and one at end of cell, ochreous white. Body with the thorax black spotted with white, the abdomen swarthy, with blue median spots." (*Butler, Proc. Zool. Soc. Lond.*, 1866, p. 274, n. 6, pl. xxix, fig. 1, male).

the cell and contiguous area also blue-glossed. The two marginal series of spots larger." (Moore, l. c.) The FEMALE differs from the male in having the inner margin of the forewing straight, the apex more rounded, and the outer margin slightly convex; also in lacking on the hindwing the large pale fuscous subcostal patch, which, in the males, covers the anterior half of the cell.

Seven males and a single female have been sent to us by Captain C. T. Bingham from the Thoungyen forests in Upper Tenasserim, the locality from which the type specimen of this species was taken by Limborg in 1876-77. Of these specimens one only has the forewing swarthy and scarcely perceptibly paler externally; all the others have the forewing rufescent-brown rather than "cupreous-brown," and with the outer margin broadly paler, and the basal three-fourths shot with bright blue; in all the cell and contiguous area of the hindwing is blue glossed; the two marginal series of spots on this wing are prominent and somewhat variable in size, and there can be little doubt that they all belong to the species separated as *E. cupreipennis* by Moore. No mention is made in the original descriptions of either this species or *E. modesta* of any spots on the upperside of the forewing; but in nearly all the specimens we have seen there are traces of white dots—in some a few marginal dots near the hinder angle, in others a more or less incomplete submarginal series, in others one or two on the disc outside the cell, or one in the cell, or one subcostal, but in all cases these dots, even when conspicuous, are small and so variable that no two specimens appear to exhibit them to precisely the same extent.

Dr. J. Anderson also took numerous specimens for the Indian Museum during the cold weather in the Meigui archipelago. They present precisely the same differences as are shown in the specimens taken by Captain Bingham. One pair have no spots whatever on the upperside of the forewing. The females of *E. cupreipennis* can be distinguished from the same sex of *E. margarita* by their smaller size, and the discal spots on the upperside of the forewing, when present, being pure white instead of violet. We have seen no specimens precisely answering to the description of *E. modesta*; but *E. cupreipennis*, if distinct, is evidently very closely allied to it, and it seems probable that both forms represent only a single species which should stand as *E. modesta*.

60. *Euploea bremeri*, Felder.

E. bremeri, Felder, Wein. Ent. Monatsch., vol. iv, p. 398, n. 16 (1860); id., Distant, Rhop. Malay, p. 23, pl. 1, fig. 4 (1882), male.

HABITAT: Mergui, Penang, Malacca, Singapore, Borneo, Sumatra.

EXpanse: 2.9 to 3.9 inches.

DESCRIPTION: "MALE: UPPERSIDE blackish-swarthy, with a marginal series of white spots on both wings. Forewing with two or four discal spots, and eight outer spots (the fourth and fifth much larger), white. Hindwing with an outer row of white dots more or less obsolete. UNDERSIDE, both wings swarthy, with the outer and marginal spots as on upperside. Forewing whitish inwardly, with a costal spot, and four others discal (one in the cell). Hindwing with six or seven discal spots (one in the cell), white. Very nearly allied to *E. crameri** (Lucas, Moore), but differing in the presence of the marginal spots of the forewing, and the outer spots of the hindwing." (Felder, l. c.)

Dr. J. Anderson met with this species very commonly in the Mergui archipelago throughout the cold weather. The males on the upperside of the forewing have usually four discal spots, one subcostal just above the extremity of the cell, one in the cell, and one in each of

* *E. crameri*, Lucas, Rev. Zool., 1853, p. 318. (Plate viii, fig. 15, male) HABITAT: Borneo. EXpanse: 3.65 inches. DESCRIPTION: MALE: "UPPERSIDE wholly velvety blackish-brown, having a bluish tint, and slightly paler on exterior margins. Forewing with a short transverse row of six white spots from anterior margin, close to apex, the first two small, the third large and longest, the fourth the same size as the first, fifth and sixth very small, also a small spot near discoidal cell, between first and second median nervules. Hindwing with two small white spots near anterior angle. UNDERSIDE, clear deep brown. Forewing with white spots as on upperside, also with three spots along costal margin, and some on the disc. Hindwing, with a submarginal row of small white spots, and some on the disc." (Moore, Horsfield and Moore, Cat. Lep. E. I. C., p. 120, n. 256 (1857).)

The figure is taken from a male specimen from Borneo in the Indian Museum, Calcutta, and shows the upper and underides.

the median interspaces; the spot in the cell and the spot in the lower median interspace are however sometimes wanting. The two marginal series of spots on the hindwing occasionally do not reach the anal angle. On the underside there are either two or three discal spots on the forewing, besides invariably one in the cell. The FEMALES are a little more variable; some have a spot in the cell of the forewing on the upperside, and two spots in the median interspaces; others have a complete series of five spots, one in each interspace, outside the cell, and two subcostal spots. The marginal series of dots are sometimes obsolescent towards the apex.

An allied species, *E. moldyica* * is recorded from Penang, &c.

Sixth Group—EUPLECA, *Fabricius* (Restricted).—"The species of this group are for the most part similar in form to those of the *Crastia* group, but the male has a more or less strongly defined longitudinal band on the interno-median area of the forewing" (*Butler*, Journ. Linn. Soc., Zoology, vol. xiv, p. 299, 1878). The true *Euplaas* are the most widely spread of all the groups, and present the greatest variation in colour. There are fourteen species in the Indian region, and one or other species is found commonly in almost every part of India.

Key to the Indian species of Euplaea

- A. With the sexual brand short (under 20 of an inch, except in *E. subdita* 25) narrow, inconspicuous.
- a. Velvety brown, with a more or less complete and conspicuous double row of whitish spots on the outer border of both wings
 - a¹ Forewing with the spots of inner row at apex rounded
 - 61 *E. CORE*, India
 - b¹ Forewing with the inner spots at apex large and elongate.
 - 62 *E. VERMICULATA*, N. India.
 - c¹ Forewing with the outer spots at apex obsolescent
 - 63 *E. ASPLA*, Ceylon
 - E. LAVARDI* Siam
 - d¹ As in *E. core*, but with the basal area shot with blue, the spots smaller.
 - 64 *E. SUBDITA*, Burma.
 - b. Deep swarthy, with border spots small and rounded
 - a² Hindwing with inner row usually conspicuous
 - 65 *E. ESPERI*, Nicobars.
 - b² Hindwing with the inner row wanting
 - 66 *E. FRAUENFRIEDII*, Ceylon

* *Crastia malayica*, Butler, Journ. Linn. Soc., Zoology, vol. xiv, p. 297 (1878). *Euplaea malayica*, Distant, Rhop. Malay, p. 22, pl. 11, fig. 7 (1882), male. HABITAT: Malacca, Penang, Singapore. EXPANSION: 4.6 inches. DESCRIPTION: "Closely allied to *Crastia ochsenheimeri*, Moore, † but larger, considerably darker, and with the white spots much larger. Both the submarginal series in the hindwing of the MALE complete; the FEMALE with a spot in the cell, followed by three complete series" (*Butler* l.c.). "This is but a constant local race of *E. ochsenheimeri*, Moore, a species which Butler considers is probably the *E. gyllenhali*, Lucas, and is apparently confined to Java. The Bornean form has also been separated, under the name *E. scudderi*. *E. malayica* is in itself variable, as in a second male specimen which I possess, the spots on the upper surface are much smaller, and the submarginal spots on the hindwing are very faint and obscure towards the anal angle" (*Distant*, l.c.).

† *Euplaea ochsenheimeri*, Moore. Horsheld and Moore, Cat. Lep. F. I. C., vol. 4, p. 132, n. 264 (1857). HABITAT: Java. EXPANSION: 3.75 inches. DESCRIPTION: MALE. UPPERSIDE: silky brown, darker on the hindwing, and having a golden greenish metallic lustre in some lights. Forewing with a submarginal row of small white spots (two between each nervule), two other parallel rows of somewhat larger spots (one between each nervule in each row), also one spot between first and second branches of subcostal vein, and one within the discoidal cell; narrow cilia between indentations spotted with white. Hindwing with two short rows of four very small white spots near anterior angle narrow cilia spotted with white. UNDERSIDE: as above, but the hindwing having the submarginal row of white spots continued along the whole margin, also a row outside discoidal cell some white spots also at the base of the wings. FEMALE: paler, the rows of white spots on UPPERSIDE of forewing disposed exactly the same, but are larger, those on the hindwing more straggling, and but few being distinct. UNDERSIDE: as above, the forewing having also a longitudinal club shaped streak between submedian and median nervures. Hindwing with three rows of white spots also one spot within discoidal cell, and some spots disposed at base of the wings. Shape of wings as in *Euplaea midamy*, (Moore, l.c.).

- B. With the sexual brand short ('20 to '30 in *E. andamanensis*, '25 to 35 in *E. godartii* and *E. camorta*), but conspicuous and rather broad.

a. Upperside with spots on the border

a¹ Pale brown, darkest on external border.

67. *E. ANDAMANENSIS*, Andaman.

b¹ Rufescent brown, apex of forewing broadly suffused with violet-white.

68. *E. GODARTII*, Burma.

b² Upperside with few or no spots on either wing, none on the outer margin.

a² Underside with two subapical spots on forewing, and five on the disc on hindwing

69. *E. SCHERZERI*, Ceylon

b² Underside with no subapical spots on forewing, and six to seven on the disc on hindwing.

70. *E. CAMORTA*, Nicobars

- C. With the sexual brand long (45 in *E. alcathoe*), and conspicuous, the inner row of spots on hindwing narrow and very elongate.

a. Forewing velvety black, scarcely perceptibly glossed with violet, both rows of spots on hindwing prominent.

71. *E. ALCATHOE* N.-E. India, Burma.

b. Forewing shot with violet, outer row of spots on hindwing obsolete.

72. *E. MNETRIENII* N.-E. India? Burma.

- D. With the sexual brand long (55 in *E. deione*, 65 to 75 in *E. limborgii*), very broad and conspicuous. Forewing splendidly shot with blue.

a. Hindwing with border spots obsolescent.

73. *E. DEIONE*, N.-E. India.

b. Hindwing with border spots prominent.

74. *E. LIMBORGII*, Burma

E. PINWILLI, Malacca

The first four species—*E. core*, *E. vermiculata*, *E. asela*, and *E. subdita*—are probably merely local races or subspecies of *E. core*, *E. subdita*, which represents the Burman form, is the most distinct of all, with its perceptible blue shot, and comparatively large sexual brand. *E. asela*, the Ceylon form, is distinct too as far as typical specimens from that island are concerned; but the *E. core* of South India shows a very close approach to it, some specimens being indistinguishable from the Ceylon form. *E. vermiculata* of Northern India is more variable still, typical specimens are easily recognised, but the gradations between it and the typical *E. core* are so numerous that it is impossible to separate the two.

61. *Euplea core*, Cramer. (PLATE IX, FIG. 16 ♂ ♀).

Papilio core, Cramer, Pap. Ex., vol. iii, pl. CCLXVI, figs. E, F (1780); *Danaus coreta*, Godart, Enc. Méth., vol. ix, p. 178, n. 6 (1819)

HABITAT: India generally.

EXPANSE: ♂, 3.0 to 4.0; ♀, 3.4 to 3.8 inches.

DESCRIPTION: UPPERSIDE rich dark velvety-brown, rather paler on the hindwing, and much paler on the margin, narrowly on forewing, more broadly on hindwing; a double continuous series of white spots on the margin of both wings, those on the hindwing largest. The inner series is on the forewing continued prominently right up to the costa, one spot between each pair of nervules, rounded; on the hindwing the spots above the third median nervule are as on the forewing; below that nervule they are somewhat elongate-oval, and two between each pair of nervules. The outer series consists of two spots between each pair of nervules on both wings, decreasing towards the apex of forewing, where the uppermost are obsolete. A small internal silky streak on the forewing in the MALE. The FEMALE is paler than the male, is without the silky streak, has a straight inner margin to the forewing, and usually a white subcostal dot near upper end of cell in that wing, and one outside the cell between the first and second median branches in addition to the two series of marginal spots, which latter are

larger and more cloudy at the edges on the forewing. UNDERSIDE paler, darkest on the disc of the forewing, the marginal spots as above but more prominent and whiter. Forewing in both sexes, with a subcostal spot, three or four on the disc (one in the cell), and an internal streak, violet-white. Hindwing with a spot in the cell, and five on the disc round the end of the cell, violet-white; in the male the second of these spots is sometimes wanting: the usual basal spots.

Papilio cornu (Fabricius, Ent. Syst., vol. iii, pt. i, p. 41, n. 122 (1793) is usually identified with this species, but according to the original description "*Danaus cora* appears to differ from *D. cornu* (= *E. cornu*) only in having on the upperside four white dots on the middle of the forewing, and two similar ones in the middle of the hindwing." (Godart, Enc. Méth., vol. ix, p. 178, n. 7, 1819).

LARVA.—Above lilac, with three transverse darker lines on each segment, the spiracular region being ochreous, the abdominal region deep brown; with two tentacula on the second segment springing from the spiracular region one on each side and pointing forwards in front of the head; and two curled ones each on the third, sixth, and twelfth segments, springing from the subdorsal region. The spiracles have each a dark brown border "Reared on *Nerium odoratum*." (Lang). PUPA.—Smooth, rounded and fulvous, beautifully marked with silvery or golden dots and streaks. Figured on plate iv, figs. 9, 9a, of Horsfield and Moore's Cat. Lep., E. I. C. (1857).

E. core is by far the commonest and most widely spread of all the *Euploas*, being found in suitable localities throughout the continent. It does not appear to extend into Tenasserim, where it is replaced by the closely allied *E. subitula*. In the N. W. Himalayas it occurs up to an elevation of about 8,000 feet, but is never common at this altitude.

The figure shows the upperside of a male and female from Calcutta specimens in the Indian Museum, Calcutta.

62 *Euploa vermiculata*, Butler.

E. vermiculata, Butler, Proc. Zool. Soc. Lond., 1866, p. 276, n. 24.

HABITAT: Northern India

EXPANSE: 3.25 to 4.1 inches.

DESCRIPTION: "UPPERSIDE: Forewing swarthy, the outer margin paler; with nine submarginal spots, rather large at the apex, and marginal spots much smaller, white. Hindwing paler, fuscous at base, with two submarginal rows of white spots, the inner row of large elongate spots. Body swarthy. Head black, dotted with white. Antennæ black. UNDERSIDE, paler. Forewing with one costal spot, two discal, and one near end of cell, white; submarginal rows as on upperside, but larger. Hindwing with submarginal spots near apex and anal angle coalescent; otherwise as on upperside; five discal spots in an angulate row beyond the cell, and one near end of cell. This species appears to be allied to *E. core*, of which it may possibly be the northern form; it differs from it chiefly in having the submarginal spots exceedingly large and distinct, especially near the apex." (Butler, l. c.).

We retain this species on Butler's authority, but it does not seem a satisfactory one. The *E. core* of north India approaches the *E. vermiculata* type in precisely the same way as the *E. core* of extreme south India approaches the *E. asela* type. A few picked specimens of *E. vermiculata* taken separately, appear very distinct, but the type is not constant even in the same locality. In a large series collected at Naasahar, in the Saharanpur district, by Mrs. Deane, there were several specimens of typical *E. vermiculata*, male and female, several of typical *E. core*, and numerous intermediate forms.

63. *Euploa asela*, Moore.

E. asela, Moore, Ann. and Mag. Nat. Hist., fourth series, vol. xx, p. 45 (1877); Id., Lep. Ceylon, p. 12, pl. vi, fig. 2, *imago*, *an. caespitillar* and *chrysalis* (1880).

HABITAT: Ceylon.

EXPANSE: 3.25 to 3.80 inches.

DESCRIPTION: "MALE and FEMALE. UPPERSIDE dark velvety olive-brown, broadly paler externally. *Forewing* with a submarginal and less distinct lower marginal row of small brownish-white spots, the former series curving to the costa before the apex. MALE with a single short slender sericeous streak between the first median nervule and submedian nervure. *Hindwing* with a submarginal row of brownish-white oval spots, and a marginal row of smaller round spots. UNDERSIDE paler, both rows of marginal spots clearer; both wings with a small spot at end of the cell, and a contiguous discal curved series of spots. *Body* blackish; thorax, head, palpi, forelegs and abdomen beneath white spotted; middle and hindlegs beneath white streaked."

"LARVA cylindrical, purple-white or dove-colour, with a pair of curled red fleshy filaments on three of the anterior segments, and a pair on the twelfth segment; each segment transversely barred with narrow white lines, lateral band pinkish-white with black and red dots; abdominal line black; head and legs black, streaked with white. Feeds on *Nerium oleander*, &c. PUPA golden yellow, constricted below the thorax, streaked and banded with brown; dorsal segments black spotted." (Moore, Lep. Cey.)

In Ceylon "found everywhere. in the plains and up to 6,000 feet, in forest or open ground. At Colombo it occurs from October to January; elsewhere all the year. Flight slow, heavy. Often comes into the house in numbers, sometimes settling on one's clothes." (Hutchison). The typical form is found in the island of Ceylon, but specimens from south India approach this form very closely, just as in the parallel case of *Danais grammica* and *D. ceylanica*. *E. asela* is apparently only a geographical variety of the Indian *E. core*.

In Siam another species, *E. layardi*,* occurs, which appears to be closely allied to this group: it seems to differ only from *E. asela* in having a subcostal spot above the upper end of the cell, and another spot below the lower end of the cell in the second median interspace

64. *Euploce subdita*, Moore.

E. subdita, Moore, Proc. Zool. Soc. Lond., 1878, p. 823.

HABITAT: Akyab, Upper Tenasserim.

EXPANSE: ♂, 3.13 to 3.90; ♀, 3.70 inches.

DESCRIPTION: "Allied to *E. core*. MALE: UPPERSIDE paler, markings similar, smaller and paler. *Forewing*, shorter, broader, and the posterior margin more convex; basal area slightly blue-glossed; markings indistinct." (Moore, l. c.) The FEMALE differs from the same sex of *E. core* in being paler, the submarginal row of spots on the *forewing* reduced to two at the apex, and three at the posterior angle, these spots all very small; the marginal series reduced to five, which are confined towards the posterior angle of the wing. Both series of spots on the *hindwing* are also smaller.

The male of this species can at once be distinguished from *E. core* by the perceptible blue gloss of the *forewing*, and the female by the two series of spots on the *forewing* being, compared with *E. core*, almost obsolete.

The Indian Museum has two specimens, male and female, taken by Mr. Wood-Mason, at Akyab, in September.

The next two species, *E. asperi* and *E. frauenfeldii*, are closely allied, but as in the parallel cases of *E. camorta* and *E. scherzeri*, and of *Danais nicobarica* and *D. exprompta*, the local races are separable; the Ceylon species *E. frauenfeldii* differing from the Nicobar form chiefly in the almost complete absence of the inner marginal row of spots on the *hindwing*, and the fainter development of the outer row. *E. frauenfeldii* is very rare, and the female is

* *E. layardi*, Druce. **HABITAT:** Chentaboom, Siam. **EXPANSE:** 4 inches. **DESCRIPTION:** "UPPERSIDE, brown, paler round the outer margin. *Forewing*, with two whitish spots at the end of [outside] the cell, and a double row of white spots round the outer margin. *Hindwing* with a band of oval-shaped white spots crossing it from the anal angle to the anterior margin, and a submarginal row of small white spots. UNDERSIDE as above, except that all the white spots are plainer." (Druce, Proc. Zool. Soc. Lond., 1874, p. 103, n. 9, pl. xvi, fig. 1).

still unknown. *E. esperi* has recently been discovered to be far from uncommon in the Nicobar isles, and as might be expected the extent to which the spots of both wings are developed is found to be very variable. In one male specimen from Pulo Kondol in the Indian Museum, Calcutta, the hindwing has only a single marginal series of dots. Both species differ from the *E. core* type in the much darker colour of the surface, and the small size of the white spots, also in the presence of discal spots on the upper surface, which are absent from all the races of *E. core* except *E. layardi*.

65. *Euploea esperi*, Felder.

E. esperi, Felder, Verh. zool.-bot. Gesellsch. Wien, vol. xii, p. 482, n. 109 (1862), female; *E. frauenfeldii*, id., Reise Nov., 1 ep., vpl. ii, p. 342, n. 474 (1865), female; *E. esperi*, Moore, Proc. Zool. Soc. Lond., 1877, p. 582, id., Wood-Mason and de Nicéville, Journ. A. S. P., vol. 1 pt. ii, p. 297 (1881).

HABITAT: Nicobars.

EXPANSE: 3.4 to 3.8 inches.

DESCRIPTION: "FEMALE.—Wings paler [than in *E. frauenfeldii*], with the discal spots of the underside showing through above. Forewing with a subcostal spot, three discal (one in the cell), seven others external in a bent series, the two uppermost excepted, rather large (the third larger), and dots before the margin (the uppermost evanescent). Hindwing with the external spots small and elongate, and rather large dots before the margin swarthy, powdered with white. UNDERSIDE with the marginal spots of the upperside whiter. Forewing with two subcostal spots, below the second beyond the disco-cellular nervule a pair of elongate spots, narrow, a cellular spot, sinuate within, a pair median, a prolonged interior spot and a streak below that. Hindwing with a spot in the cell, often geminate, and six around it (the second larger), violet-white." (Felder, l. c. in Reise Nov.)

MALE swarthy black, markings on the UPSIDE similar to those of the female, but with the usual sexual mark, and the inner margin of forewing convex. On the UNDERSIDE the markings are also similar, but several of the discal spots of the forewing are obsolete or wanting.

This species has as yet only been taken in the Nicobars, where it is one of the commonest Butterflies.

66. *Euploea frauenfeldii*, Felder.

E. frauenfeldii, Felder, Verh. zool. bot. Gesellsch. Wien, vol. xii, p. 479, n. 87 (1862), male, from Ceylon; Reise Nov. Lep., vol. ii, p. 342, n. 474, male, female, pl. xii, fig. 4, male (1865); *E. frauenfeldii*, Moore, Lep. Ceyl., p. 12 (1880).

HABITAT: Ceylon.

EXPANSE: ♂, 3.6 inches, (Felder's plate), 4 inches (Moore).

DESCRIPTION: "MALE: UPSIDE deep rufescent swarthy. Hindwing a little paler on the margin, the anterior area powdery, and with a somewhat pearly streak as usual. Forewing with a subcostal spot, another discal, five on the outer margin near apex (the second elongate), and dots before the lower outer margin. Hindwing with white dots before the margin in a bent series. Forewing with a cellular spot, and a pair of median spots showing through from the underside, powdered with white. UNDERSIDE paler, the usual basal dots, the spots of the upperside but whiter. Forewing with a geminate spot in the cell; in addition, another short sublinear, and beyond that a third median somewhat large. Hindwing with a small spot in the cell, and five others in an angulate series around it decreasing, unequal, violet-white. Forewing with an anterior raised spot powdered with hoary, and an internal streak somewhat pearly. Hindwing with a minute geminate white spot above the middle of the outer margin." (Felder, l. c. in Reise Nov.)

FEMALE unknown. In the "Reise Novara" Felder unites his *E. esperi* with this species, describing *E. esperi*, ♀, as the female of *E. frauenfeldii*, and giving Ceylon as the sole habitat for the species; but numerous specimens of the male of *E. esperi* from the Nicobars, hitherto undescribed, are in the Indian Museum, Calcutta. *E. frauenfeldii* is known only from Ceylon, where it is evidently very rare; we have never seen a specimen.

Moore, in the Lepidoptera of Ceylon (p. 12), gives the following description of the male of this rare species, which differs somewhat from the original description by Felder quoted above:—"UPPERSIDE blackish purple-brown. *Forewing* blue glossed, a very small white costal spot above end of the cell, a spot between third and second median nervules, a submarginal series of spots curving from apex, and a lower marginal series of smaller spots, a slender short sericeous streak below the first median nervule. *Hindwing* unmarked, except that it indistinctly shows a submarginal and marginal series of pale brown spots. UNDERSIDE dark olive-brown. *Forewing* with a bluish costal spot, a spot at lower end of the cell, a spot between the third and second median nervules, and a larger elongated white spot below it, the sexual streak and posterior [inner?] margin being brownish white; submarginal and marginal spots as above. *Hindwing* with a minute bluish spot at end of the cell, and a contiguous discal series of spots, a marginal series of small white spots, and a submarginal anal series of three or four spots. *Body* black; head, thorax, palpi and abdomen beneath white spotted; legs black. *Expanse*, 4 inches. Taken at Trincomalee on the north-east side of the island."

67. *Eupicea andamanensis*, Atkinson.

E. andamanensis, Atkinson, Proc. Zool. Soc. Lond., 1873, p. 736, n. 2, pl. lxiii, fig. 2, male.

HABITAT: Port Blair, Andaman Isles.

EXPANSE: 3'12 to 4 inches.

DESCRIPTION: "Pale fuliginous with white spots. *Forewing* with a white spot between the extremity of the cell and the costa; another within the cell near its extremity; two others below the cell, one between the first and second, the other between the second and third median nervules; beyond these a curved series of nine white spots from the anterior margin to below the exterior angle, of which the three last are the largest; followed by a submarginal series of smaller elongated spots, extending from the first discoidal nervule to the exterior angle. The interior margin much rounded in the MALE, in which sex there is a single vitta of dark adpressed scales between the first median nervule and the submedian nervure. In the FEMALE the vitta is replaced by a white streak. *Hindwing* with two somewhat irregular series of elongated white spots, corresponding to the two series in the forewing." (Atkinson, l. c.) UNDERSIDE as on upperside, but on the forewing the inner discal series of spots is often complete right up to the costa, the lowest spot largest and round, the second also round, but smaller, the four upper ones linear and small. In many specimens some or all of these four latter spots are wanting. On the hindwing there is a large, sometimes geminate, spot in the cell, and six irregular discal spots round the end of it in addition to the border rows as on upperside. The discal spots occasionally show faintly by transparency on the upperside also. FEMALE as in the male, except that on the UPPERSIDE in the forewing, the sexual streak is replaced by a white rather elongated spot, and the inner margin is nearly straight, not outwardly lobed. On the hindwing, the spot in the cell and the six discal spots are faintly present on the upperside, as well as the border rows of spots. UNDERSIDE as in male.

E. andamanensis is a very distinct species; it is common at Port Blair from March to August, and possibly at other seasons. The original description by Atkinson quoted above has been supplemented and completed from a large series collected by Colonel T. Cadell, V.C., Chief Commissioner of the Andamans, and by Mr. F. A. de Roepstorff, Deputy Commissioner. A marked feature of this species is that the ground-colour is darkest at the outer border instead of at the base of the wings, as is usual in this group. It has only been found as yet in the Andaman islands.

68. *Eupicea godartii*, Lucas.

E. godartii, Lucas, Rev. Zool., 1853, p. 319. *E. siamensis*, Felder, Reiss Nov., Lep., vol. 2, p. 342, n. 473, pl. xli, fig. 6 (1865), male.

HABITAT: Burma.

EXPANSE: ♂, 3'0 to 4'2; ♀, 3'2 to 4'0 inches.

DESCRIPTION: "Wings above fuscous, paling on the outer margin. Forewing with the apex widely tinted with rosy violet, and white dots as in *E. alcaatho*. Hindwing as in *E. core*. UNDERSIDE as in *E. core*, but with the discal spots larger." (Lucas, l. c.)

The above is the original description by Lucas, which is hardly sufficiently full. The UPSIDE is more brown than swarthy, dark and velvety on the basal half, the outer border broadly paler, and somewhat rufescent. On the forewing the violet apical patch, which is formed by a powdering of the spaces between the nervules, varies much both in extent and intensity; in some it extends from the costal margin to the first median nervule, and almost to the end of the cell; in others it is almost entirely absent. The spots too vary very much; the full complement is one subcostal spot, one at end of cell, two on the disc, a few marginal, a few submarginal, and three subapical, the latter being circled with dark brown, and sometimes very prominent; but some of these spots are more or less obsolete in every specimen, and in some they are almost entirely wanting. In the MALE also there is a single small interno-median silky streak, and the inner margin is somewhat convex; in the FEMALE the silky streak is wanting, and the inner margin is nearly straight. Hindwing marked with two series of spots on the margin, as in *E. core*, but the spots are smaller, especially the inner series, and more or less sullied with brown. The costal margin is whitish, with a white subcostal spot. UNDERSIDE paler brown, darkest on the disc of the forewing. Forewing with the internal margin whitish, and an indistinct whitish streak on the interno-median area; a subcostal spot, a spot at end of the cell, one or two on the disc, and an elongate oval median spot below, violet-white; a few marginal spots near anal angle, three subapical, very variable in size, sometimes absent, and a few posterior ones sometimes wanting in a submarginal series, pure white. Hindwing with a spot in the cell, and five or six round the end of it, discal, violet-white; the two marginal series of spots as on upperside, but more prominent and pure white. The usual basal spots. In the FEMALE the median spot on forewing is rounded, not elongate-oval, otherwise the markings are similar.

In a female specimen, taken by Captain C. H. E. Adamson, at Moulmein, in September, the submarginal series of spots on the forewing is complete, those below the third median nervule being large, pure white and very prominent.

E. godarti is a very distinct species, with its violet powdered apical patch. It appears to be common in Burma from February to July. It was found by Captain Bingham in the Meplay valley in February, and in the upper Thaukygyen forests in April. By Limborg it was found in upper Tenasserim, also at Ahsown, Moulmein to Meean, Hatsiega, Houngduran, and Naththoung to Paboga. In Rangoon it is common in June, July, and September, probably throughout the year. Dr. J. Anderson found it abundantly in the Mergui archipelago during the winter.

69. *Euplessa scherzeri*, Felder.

E. scherzeri, Felder, Verh. zool.-bot. Gesellsch. Wien, vol. xii, p. 479, n. 88 (1862); id., Reise Nov., Lep., vol. ii, p. 335, n. 463 (1865); id., Moore, Lep. Cey., p. 12 (1880).

HABITAT: Ceylon, Java.

EXPANSE: 3·5 inches (Moore).

DESCRIPTION: "MALE: UPSIDE deep swarthy, much paler and brownish on the outer margin. Forewing with a single short velvety streak in the interior. UNDERSIDE: Both wings concolorous, but a little paler. Forewing with two internal whitish streaks (the upper one narrow, linear); a spot and two dots discal, a spot below the middle of the costa, and two subapical, bluish-white. Hindwing with five very small discal spots (one in the cell), bluish-white." (Felder, l. c. in Verh. zool.-bot. Gesellsch. Wien)

This species is unknown to us. It seems to be closely allied to *E. camorta* from the Nicobars. It has never been figured, but Moore gives the following detailed description in his Lepidoptera of Ceylon:—"MALE: UPSIDE purplish olive-brown, darkest on basal area. Forewing with a minute white subapical spot, and a lengthened sericeous streak between first median nervule and submedian nervure. Hindwing with a subapical series of three small

very indistinct pale brown spots. **UNDERSIDE** paler. *Forewing* with a bluish-white small costal spot, one at lower end of the cell, two beyond, and an elongated lower spot, three or four submarginal spots below the apex. *Hindwing* with a small bluish-white spot at lower end of the cell, a contiguous discal series, three upper submarginal spots and a marginal lower series of spots. *Body* black; head, thorax, palpi and abdomen beneath white spotted; legs black. *Expanse*, 3.5 inches." The female has never been described.

70. *Euploea camorta*, Moore.

E. camorta, Moore, Proc. Zool. Soc. Lond., 1877, p. 582; id., Wood-Mason and de Nicéville, Jour. A. S. B., vol. I, pt. II, p. 228 (1881).

HABITAT: Nicobars.

EXPANSE: ♂, 3.5 to 4.2; ♀, 3.6 to 4.1 inches.

DESCRIPTION: "MALE: **UPPERSIDE**: Both wings dark blackish olive-brown, paler on the outer margins. *Forewing* with a short straight narrow silky streak between the first median nervule and submedian nervure. *Hindwing* with the anterior border broadly cinereous, the upper part of the cell being slightly greyish-brown. **UNDERSIDE** paler. *Forewing* with four bluish-white spots, one being on the costa above the end of the cell, another at its lower end, the other two outside; the sexual streak long, narrow, and patch on hind margin pale flesh-colour. *Hindwing* with seven median bluish-white spots." (Moore, l. c.) The FEMALE differs from the male in the outer margin of both wings being paler, the inner margin of the *forewing* is straight instead of convex, and in the absence of the sexual mark. In addition there is usually a conspicuous violet-white subcostal spot above the end of the cell, and one outside the cell below the third median nervule.

E. camorta, with its conspicuous broad pale margin to both wings, is a very distinct form, having no Indian allies, except apparently *E. schreazeri* from Ceylon. Some specimens show a few spots on the disc on the upperside. It has only been found as yet in the Nicobars, where it is very commonly met with, occurring probably all the year round.

The next two species, *E. alathoe* and *E. menetriesii*, may be distinguished by the very elongate submarginal spots on the hindwing, which gradually lengthen from the apex to the inner margin, at which point they extend nearly to the base of the wing. They are found only in north-east India and Malayana. In these and in the two remaining species, *E. deione* and *E. lamborgii*, the forewing is of a more elongate-ovate form than in any of the preceding species.

71. *Euploea alcathoe*, Godart. (PLATE IX, FIG. 17 ♂ ♀).

Danaüs alcathoe, Godart, Enc. Méth., vol. 12, p. 178, n. 5 (1819); *E. doubledayi*, Felder, Reise Nov., Lep., vol. II, p. 337, n. 467 (1865).

HABITAT: Sikkim, Sylhet, Assam, Naga Hills, Cachar, Mergui, Upper Tenasserim.

EXPANSE: 3.2 to 4.2 inches.

DESCRIPTION: "UPPERSIDE: *Forewing* deep chestnut swarthy, in certain positions slightly suffused with violet, paler at the inner margin: with an internal short and narrow silky streak, and minute white dots before the outer margin. *Hindwing* less intense in colour, much paler towards the margin: with a pearly costal dot, and the anterior area concealed with raised scales, giving the usual powdery appearance; a row of external greatly increasing spots radiate on the inner margin; and others before the margin, slightly elongate, increasing, white, powdered with brown; the lowest of the inner row confluent with the corresponding marginal ones. **UNDERSIDE**, much paler; the usual basal dots. *Forewing*, darker in the disc, a subcostal spot, and two in the disc (one in the cell), violet-white; an elongate median spot, three subapical, two posterior minute, and a few small dots before the outer margin, white; the internal margin hoary, with an elevated spot and pearly streak, as usual, concealed. *Hindwing* with a spot in the cell, and others very minute around it, violet-white; the marginal spots as on upperside, but longer and whiter. FEMALE, wings much paler. **UPPERSIDE**: *Forewing* with a subcostal

spot, and three discal (one in the cell), violet-white; two or three posterior spots, a few dots before the outer margin, and often with two minute subapical spots, white. *Hindwing* with the costal margin hoary-white, the spots as in the male, but the interior ones longer, *UNDERSIDE* almost as in the male, but the discal spots, and the posterior spots of the *forewing*, much larger. *Forewing* with an interior much elongated spot, violet-white." (Felder, l. c.)

The above description is taken from Felder's description of *E. doubledayi*, which was redescribed as distinct on account of Godart's original description of *E. alcathoe* purporting to be from an Amboyna specimen, but there is no doubt that Godart's locality was incorrect, and the name *E. alcathoe* will stand for this species. The male of *E. alcathoe* is a very black insect, the violet suffusion being scarcely perceptible; and, in the female especially, the very elongated narrow submarginal streaks form a conspicuous distinctive character. On the underside of the forewing of the male the three subapical spots, two minute posterior ones, and the few small dots before the outer margin referred to in the description above, are entirely absent in some specimens, and more or less so in others.

E. alcathoe was found by Limborg in Upper Tenasserim at Alisown, at 2,000 feet elevation, and Captain C. H. E. Adamson has sent a single male specimen from Moulmein; it has also been taken by Captain Bingham, who has been collecting over the same ground. In Sikkim and Sylhet it appears to be not uncommon. At Shillong a single female specimen was taken in May by the late Mr. J. P. Cock. In this specimen the marginal dots of the forewing are almost obsolete, and the submarginal series is nearly complete, the lowest spot being much the larger. Mr. Wood-Mason found it in profusion in Cachar during the summer. Dr. J. Anderson sent numerous specimens to the Indian Museum, Calcutta, collected during the winter, in the Mergui archipelago.

The figure shews the upperside of a male and female from Sylhet specimens in the Indian Museum, Calcutta.

72. *Euplea menetriesii*, Felder.

E. menetriesii, Felder, Wein Ent Monatsch, vol iv, p 398, n. 15 (1860).

HABITAT: Nepal, Assam (Butler), Malacca (Felder), Siam, Borneo.

EXPANSE: (Not stated).

DESCRIPTION: "Wings elongate. *Forewing* of the MALE with the inner margin rather convex. *UPPERSIDE* deep blackish swarthy, in certain positions shining with violet, with a rather broad velvety internal streak. *Forewing* of the FEMALE obscure brown. *Hindwing* in both sexes brown; on the *UPPERSIDE* with elongate external spots, and obsolete marginal spots, white; on the *UNDERSIDE* with the spots of the upperside white, distinct; and seven others discal (one in the cell), violet-tinted. Approaches *E. alcathoe*, but the wings are elongate, the form of the velvety stripe in the male, and the markings in the female, are different." (Felder, l. c.)

This species is unknown to us. In all probability the localities "Nepal, Assam" are erroneous, and if found within Indian limits it is most likely to occur in Tenasserim. The description of the male of this species accords closely with that of *E. limborgii*, but it is stated that it is allied to *E. alcathoe*, and the female is, as in *E. alcathoe*, obscure brown, whereas in *E. limborgii* the female is coloured similarly to the male and equally shot with splendid blue.

The next two species are distinguished from all other true *Eupleas* by the almost (generally quite) spotless velvety blackish forewing, splendidly shot with blue, except perhaps from the foregoing, *E. menetriesii*, which is said to have the forewing equally spotless and shining with violet. In *E. deione* from Assam the hindwing is spotless also, or nearly so; in *E. limborgii* from Tenasserim the hindwing has a conspicuous double row of white border spots, the inner somewhat elongate; and in *E. menetriesii*, which also has these border spots, the inner row is said to be elongate, "approaching *E. alcathoe*," which *E. limborgii* can hardly be said to do.

73. *Euplea deione*, Westwood.

E. deione, Westwood, Cat. Or. Ent., p. 76, pl. xxxvii, fig. 3 (1842), male; *E. payri*, Felder, Reise Nov., Lep., vol. ii, p. 340, n. 471 (1867), female.

HABITAT: Sikkim, Naga Hills, Assam.

EXPANSE: 3.6 to 4.4 inches.

DESCRIPTION: UPPERSIDE: MALE, black (or deep swarthy, with a slight rufous tinge on forewing, highly rufescent on hindwing). Forewing, in certain positions splendidly glossed with blue, having two small white spots, one near the middle of the wing, below the third median nervule, and the other near the middle of the costa above the end of the cell; a large and conspicuous silky brown streak runs parallel to the inner margin near the first branch of the median nervure. Hindwing unspotted (but in some specimens an obsolete marginal and submarginal row of small spots is distinctly traceable). UNDERSIDE, both wings brown, outwardly paler. Forewing with a few minute white spots at the base. A subcostal spot just above the end of the cell, a spot near the lower end of the cell, a series of spots outside the cell, one between each pair of the nervules, the lowest the largest and oblong, the second less than half the size and round, the third small and linear, all lilac-white. Hindwing with a spot in the cell and a series of four or five spots outside it, all lilac-white; sometimes a row of minute submarginal white dots, almost obliterated in the forewing.

In a series of the MALES in Colonel Lang's collection, all from Sikkim, the subcostal spot on the upperside of the forewing is wanting in some specimens; in others there is a faint cell spot, and in two or three specimens there is a fourth spot between the first and second median nervules. The hindwing in all is strongly tinged rufescent, the base and middle darker and faintly shot with blue, the forewing alone being black. In one specimen the apical portion of the forewing is distinctly powdered with pale blue in broad streaks between the nervules.

FEMALE (separately described as *E. payri* by Felder). "UPPERSIDE: Forewing deep rufescent swarthy, a little paler on the apical area and margin, in certain positions splendid violet blue almost to the margin; with a subcostal dot, another in the cell, and two median spots (the lower powdery, evanescent) white, margined with violet. Hindwing less intense and paler on the margin, with the costal margin paling and powdered with hoary; with small obsolete external spots in a subangulate series, and others before the outer margin dot-shaped, powdered with white, a little more distinct, on a paler ground. UNDERSIDE much paler, the usual spots at the base. Forewing with a subcostal spot, another in the cell, two beyond it (the upper narrow, minute—the lower small), two lower, small; and others, before the outer margin, white, more or less powdered with blue, and circled with swarthy; a rather large median spot, and two long internal ones (the upper almost linear), violet-white. Hindwing with a spot in the cell, and five beyond it in an angulate series, small, violet-white and circled with swarthy; the external spots, and others before the margin as on the upperside, but whitish and larger." (Felder, l. c.)

There can be little doubt but that this is the female of *E. deione* which is found more commonly in the same localities, and the female of which is otherwise unknown. A pair of FEMALES in Colonel Lang's collection agree with this description, except that the upperside of the forewing has, in one specimen, a fifth spot, shaped like a very small streak, below the first median nervule. On the UNDERSIDE, in the forewing, the spot in the cell is double, the inner margin is whitish, a long whitish streak below the median nervure, a large oval spot above it, a prominent round spot above that, a minute streak above again at end of cell, and a subcostal spot, are all the markings. There is no trace of any spots beyond the discal row. On the UNDERSIDE of the hindwing there are the following markings: a spot in the cell, a series of six round the end of the cell, that nearest the costa smallest, and the next to it the largest; four small submarginal spots near the anal angle, and nine small marginal spots from the anal angle, (two between each pair of nervules in each row); the cilia prominently white-spotted.

74. *Euplœa limborgii*, Moore.*E. limborgii*, Moore, Proc. Zool. Soc. Lond., 1878, p. 823, pl. li, fig. 2, male.

HABITAT: Upper Tenasserim, Mergui.

EXPANSE: 3.75 to 4.40 inches.

DESCRIPTION: "Allied to *E. deione* from northern India. UPPERSIDE differs in the *forewing* having some very indistinct submarginal white spots, and the *hindwing* having two marginal rows of prominent white spots, similar to, but smaller than, those in *E. margarita*." (Moore, l. c.)

MALE: UPPERSIDE: *Forewing* bordered with dark rufous, the rest of the wing velvety black, with a rufous tinge in some positions, in others, splendid shining blue. A broad and very long silky impressed streak on the interno-median area; and a few indistinct marginal dots near anal angle, sometimes entirely wanting. The inner margin slightly convex. *Hindwing* brown along the median nervure it is suffused darker, and faintly shot with blue on the darkest part; a submarginal row of increasing spots, round at apex, and elongate towards anal angle, and a marginal row of increasing spots, smaller and rounded throughout: in some specimens both rows are complete, prominent, and pure white; in others the spots are smaller, powdered with brown, and obsolescent at apex. UNDERSIDE brown, darkest along median nervure of *forewing*. *Forewing*, with the inner margin pale and whitish, a subcostal spot above the end of the cell, one in the cell, and two discal (the upper one a very small streak), violet-white, a prominent oval white spot between the first and second median nervures, and a few small white marginal and submarginal spots, sometimes entirely wanting. *Hindwing*, with the border rows of spots as on upperside, white; and a spot in the cell, and five small ones round the end of the cell, pale violet: the usual white basal dots. FEMALE: UPPERSIDE, as in the male, but the sexual streak is absent; the inner margin of *forewing* is straight, and a single minute white spec is apparent on the disc between the first and second median nervures. *Hindwing* identical, except that the border spots are as a rule more prominent, the inner row rather more elongated. UNDERSIDE exactly as in male, except that there is a conspicuous lengthened violet-white streak on the interno-median area of *forewing*.

E. limborgii is common in Upper Tenasserim from February till April, and perhaps at other seasons. It was found by Limborg at Ahsown, 2,000 feet above the sea, above Ahsown, at Hatsiega, and at the Hougduan source. Captain C. T. Bingham found it in the Meplay valley in February, between Meeawady and Kankarit, and in the Thoungyeen forests in March, and in the Donat range and the Thoungyeen forests in April. Dr. J. Anderson took three males and a female in December, and one male in March in the Mergui archipelago. It flies lazily in open cultivation and scrub jungle.

E. pinwilli, described by Butler from Malacca, appears to be identical with this species, and, if so, Butler's name would have the priority; but in the absence of specimens of *E. pinwilli* the point cannot be determined; the original description of *E. pinwilli** is appended.

Seventh Group.—STICTOPLCEA, Butler. "MALES for the most part with straight inner margins like the females; always with two well-defined sericeous brands on the interno-median area, and placed one above the other." (Butler, Journ. Linn. Soc., Zoology, vol. xiv, p. 301, 1878).

The males of the Indian species have the inner margin of *forewing* bowed and quite distinguishable from those of the females; but the double sericeous brand is a well-marked character.

* *E. pinwilli*, Butler. HABITAT: Malacca. EXPANSE: 4 inches. DESCRIPTION: "*Forewing* brownish piceous, purple-shot, slightly paler along the external border: a long sericeous interno-median streak. *Hindwing* paler brown, deepest at base: two marginal series of whitish spots, clear at anal angle, obsolescent and decreasing towards apex; costal area greyish. UNDERSIDE: *Forewing*, paler than above, with a subcostal spot, and an elliptical interno-median spot, pinky white; a spot in the cell, and two beyond it, bluish-white, two or three white dots at external angle. *Hindwing* with the submarginal spots clear whitish; a spot in the cell and seven in an arched series beyond it, lilacine whitish; base and pectus white spotted. *E. pinwilli* is allied to *E. monetricell*, but larger, darker, and shot with purple" (Butler, Trans. Linn. Soc., Zoology, second series, vol. 4, p. 532, pl. lix, fig. 9, 1876, where the name is spelt *E. pinwillii*).