

outer on its inner edge, defined with fuscous lines, five small perfect submarginal ocelli, the second and fifth larger, the third fourth and fifth on a clouded ferruginous ground; the margin as in the forewing, but the lines more prominent. FEMALE. UPPERSIDE as in the male, but on the forewing the large blackish spot at the hinder angle is much more prominent; and on the hindwing the ocelli are all larger and without pupils, but with the yellow iris wide and prominent in all, the outer band is also distinctly outwardly margined with yellow. UNDERSIDE precisely as in the male, but the bands on the forewing are often distinctly yellowish with fuscous margins.

E. angularis has as yet only been found in Tenasserim and in the Malay peninsula. It was originally taken by Limboig on the Taoo plateau at from 3,000 to 5,000 feet elevation; Captain C. T. Bingham took it in the Meplay valley in January, and in the Thoungyeen forests in March; and Captain C. H. T. Adamson took numerous specimens in the neighbourhood of Moulmein early in October, these latter were much worn and frayed and probably had been on the wing since early in September.

A female taken in the Thoungyeen forests in March differs from our other female specimens in the ocellus on the upperside of the forewing being very nearly round, not oval, with a distinct yellow iris of equal width throughout; the outer fascia of the hindwing much broader and very distinct, four large black spots beyond twice the size of those in the other specimens, the yellow irides prominent and touching. On the underside of the hindwing the two discal fasciæ have almost disappeared, and the five submarginal ocelli are very minute. This specimen differs only in the following particulars from Boisfield's figure of *E. medura*. The outer margin of the forewing is not quite so evenly rounded, being in fact slightly concave, the large ocellus is not quite so large as in *E. medura*, and the iris is less wide. On the underside the apical ocelli on the forewing are smaller, and on the hindwing the ocelli are minute, and the fasciæ are obsolete. This specimen, however, is much nearer *E. medura* than *E. angularis*.

Mr W. L. Distant in his *Rhopalocera Malayana* records the following note: "This species is very distinct, differing from the other three species—[*F. medura*, Java; *E. elegans*, Borneo, and *E. argentina*, Labuan]—by the more apically produced forewing, and by the inner fascia of the hindwing being acutely dentate at its middle, it also structurally differs in having the lower disco-cellular nervule of the forewing slightly directed inwardly." This latter character is not apparent in our Tenasserim specimens, and the two former characters it has in common with the more recently discovered *E. javipennis*.

The figure is taken from a female specimen in Major Marshall's collection, taken by Captain C. T. Bingham in the Meplay valley, and shows the upper and undersides.

230 *Erites falcipennis*, W.-M. and de N.

HABITAT: Cachar.

EXPANSE: 2.1 and 2.3 inches.

DESCRIPTION. MALE. Nearest allied to *E. angularis*, Moore, but differs from that species in the colouration of the upperside being dark fuliginous throughout, in the forewing being distinctly falcate, the ocellus round and prominently white pupilled, with a very narrow pale iris. Hindwing with the outer fascia and series of blind ocelli hardly defined with ochreous, the outer margin less waved, especially at the third median nervule, where in *E. angularis* the wing is produced into a short tail; the marginal lines obsolete. UNDERSIDE. All the markings duller and less ochreous. Forewing with a small round central pure white pupil to the posterior ocellus, not large, silvery and eccentric as in *E. angularis*; the iris narrow. On the hindwing the ocelli are small, the two discal fasciæ wider and a deeper ochreous; the striae on both wings shorter and more thickly disposed, forming on the hindwing a submarginal purplish band.

Mr Wood-Mason took one male in the forests near Silcui on 6th August, and another male on Nemotha at 3,300 feet elevation on 25th September.

Genus 23. — CNEIS, Hübn^{acr}. (PLATE XV.)

Cneis, Hübner, Verz. bek. Schmettl., p. 58 (1816); *Chionebas*, Boissduval, Lép. Amer. Sept., p. 214 (1833); id., Westwood, Gen. D. L., vol. ii, p. 381 (1835); id., Möschler, Wien. Ent. Monatsch., vol. vii, pp. 169, 201 (1863), *Monograph*.

"Body very hairy; wings but moderately clothed with scales, of a dull brownish buff, or dirty fulvous colour; the hindwing beneath much freckled. HEAD very small, and very hairy. Eyes prominent, naked. Palpi densely hairy in front, porrected obliquely, scarcely reaching to the level of the top of the eyes, but porrected to the length of the head; terminal joint small, slender-oval, hairy. Antennæ short, slender, gradually thickened from the middle into a long but not thick club, obtuse at the tip, concave, finely carinated beneath. Thorax very hairy. Abdomen small, slender. FOREWING elongate-triangular; the costal margin scarcely arched; apex rounded; outer margin convex, entire, about two-thirds the length of the costal; inner margin straight, not quite so long as the outer. Nervation as in *Erebia*, except that, in consequence of the greater length and narrowness of the wing, the discoidal cell is narrowed and elongated to some distance beyond the middle; the middle and lower disco-cellular nervules (the upper being obsolete), forming a nearly continuous, oblique, slightly curved line. HINDWING also elongated, so that it extends considerably beyond the inner angle of the forewing; the costal margin nearly straight; the outer margin rounded, entire, or but slightly scalloped; anal margin entire. Nervation as in *Erebia*, except that the discoidal cell is elongated and narrow, extending considerably beyond the middle of the wing; the upper disco-cellular nervule is also much elongated and the lower one as long as the space between the base of the third branch of the median nervule and the point of its junction with the lower disco-cellular. FORELEGS of the MALE very small and slender, densely clothed to the tip with long loose hairs; the femur about as long as the tibia, and the tarsus as the tibia. Four hindlegs short; femur rather thick, very hairy beneath; tibia clothed all over with long loose hairs; tibial spurs long and acute; tarsi armed beneath and at the sides with rows of spines. Claws curved, long, simple, and very acute. Paronychia and pulvillus small."

"*Cneis* is distinguished from the other genera of *Satyrina* partly by the more elongate form of the wings, and shorter inner margin of the forewing, which occasions a deeper incision between its hinder angle and the apex of the hindwing, partly by the wings being less densely clothed with scales than ordinary, and partly by the pale, livid, or obscure colours of the wings, and the hindwing marked with paler nervures beneath. Also by the very hairy condition of the four hindlegs, and the greater elongation of the discoidal cell of both wings, and of the upper disco-cellular nervule of the hindwing." (Westwood, l.c.)

The genus is a Palearctic one extending into the Nearctic region. About twenty species are known, chiefly from the Arctic regions, and from the high mountain ranges in the temperate zone; only a single species occurs within our limits at great elevations in the Himalayas.

231. *Cneis pumilus*, Felder. (PLATE XV, FIG. 37 ♂).

Chionebas pumilus, Felder, Reise Novara, Lep., vol. iii, p. 490, n. 846, pl. lxi, figs. 6, 7 (1866), male; id., Elwes, Proc. Zool. Soc. Lond., 1882, p. 404, pl. xxv, fig. 3.

HABITAT: Ladak, Sikkim, Himalayas.

EXPANSE: 1·9 inches.

DESCRIPTION: "MALE: UPPERSIDE, both wings yellowish-brown, with a band beyond the middle ochreous-yellow; the cilia whitish spotted with fuscous. Forewing with the band edged with fuscous, obsoletely submacular, furcate at apex; in the hindwing it is inwardly defined with fuscous and bisinuated. UNDERSIDE: Forewing much paler, hoary on the costal and apical border and irrorated and striated with fuscous, a ferruginous-fuscous cellular streak [on the disco-cellular nervules]; the fascia as on the upperside but edged with ferruginous-fuscous, and including a dot of the same colour between the discoidal nervules; and fuscous irrorations before the cilia. Hindwing pale fuscous, closely striated with dark fuscous, chiefly towards the base,

with hoary irrorations on the costal margin, the apex and inner margin more or less prominent; the nervules, especially the lower ones, hoary-whitish; an abbreviated dark chestnut fuscous basal streak inwardly broadly defined with ochraceous, and the fascia as on the upperside, but much paler, edged with deep chestnut fuscous especially inwardly, outwardly variegated with fuscous" (Felder, 1 c)

C. pumilus was originally taken by the late Dr Stoliczka in Ladak on the Lanak pass at about 15,500 feet elevation at Trantse Sumdo, and at Pangchog, and has never been taken since so far as we know, till quite recently Mr H J Elwes received ten specimens through a native collector in Sikkim which were taken on the borders of Thibet, and probably at a great elevation. The Sikkim race is figured by Mr Elwes (1 c), who remarks that the "specimens agree very fairly with Felder's plate but the markings are more distinct and well defined, especially the outer edge of the band on the hindwing, they are also darker in colour and less yellow in tint"

The figure of the Sikkim race differs considerably from Felder's figure. In the latter, the band on the upperside of the forewing is very broad and continuous, leaving a narrow margin beyond of yellowish brown, which almost disappears at the inner angle, whereas in the figure of the Sikkim race the band is very narrow, distinctly macular, each spot being more or less completely circled with fuscous on both upper and undersides, and the band is well removed from the margin, also on the underside of the hindwing the basal streak is altogether lost in the dark ground colour. Mr Elwes' figure represents the markings almost exactly as in *Aulocera brahminus*; the band is identical in formation, and the bifurcated apical portion includes a small dark spot with pale pupil,—in fact it resembles exactly a very small specimen of *A. brahminus* strongly tinted with yellow throughout. Felder's figure on the contrary much resembles in general appearance a small *Hipparchia*, except that on the underside of the hindwing the yellow fascia is in strong contrast with the grey fuscous ground-colour, and the fascia of the upperside has no trace of the black spots on it which are found in all the Indian *Hipparchias*. It appears to us that the races are separable, and that the Sikkim race should be separately named, but in the absence of specimens it is impossible to decide this.

The figure (which is copied from Felder's figure in the *Reise Novara*) represents the upper and undersides of a male specimen.

Genus 24.—EREBIA, Dalman (PLATE XV)

Erebia, Dalman *Svensk Handl.* p 58 (1816). — *Bousduval Gen Ind. Meth.* p 36 (1840), id., *Westwood Gen D L.* vol ii p 376 (1851). *Munial's*, Schrank, *op. et Kirby*.

"BODY moderately robust, hairy. HEAD moderate sized, clothed with very long hairs. Eyes prominent, lateral, naked, the fore part differently coloured from the hinder part in dried specimens. Palpi projected obliquely, the tips ascending higher than the level of the tops of the eyes, and reaching further in front than the length of the head, very densely clothed with long hairs, extending in front at right angles, and almost concealing the terminal joint, which is slender, short, and villose. Antenna not half the length of the forewing, slender, the joints scarcely distinct, terminated by an oval, rather short, but gradually formed club, (which in some species is short, broad, and spoon-shaped), its basal portion hollowed within, but its extremity curved outward and obtuse. Thorax short, oval, very hairy. Abdomen moderately short and slender. FOREWING triangularly ovate entire, and convex along the outer margin; the costal margin but slightly arched; apex rounded, outer margin about three-fourths of the length of the costal, hinder angle rounded, inner margin scarcely as long as the outer, nearly straight. Costal nerve extending rather beyond the middle of the costa, slightly swollen at the base, or not thicker than the rest. Subcostal nerve slender, its first and second branches arising before the anterior extremity of the discoidal cell, the third and fourth branches free, arising at a greater or less distance apart, beyond the cell; upper disco-cellular generally obliterated, middle disco-cellular shorter than the outer one, but rather variable in its direction; lower disco-cellular considerably longer, nearly straight, but oblique, its extremity being directed towards the outer margin, closing the discoidal cell almost transversely nearly at the middle of the wing, uniting with the third branch of the median nerve at a shorter distance from its base than exists between the first and second branches; the third

branch being angulated at the place of junction, beyond which it is nearly straight; the *median* and *submedian* nervures not dilated at the base. *HINDWING* suboval, entire along the anal margin [it is slightly incised in the Indian species]; the outer margin also entire, or but slightly scalloped; beneath often marked with dark freckles, with a broader dark subcentral fascia. *Subcostal nervure* arising nearer the body than the præcostal, its branch arising at a moderate distance from the base of the wing; the *upper disco-cellular* longer than the space between its base and that of the branch, and sometimes rather arched; the *lower disco-cellular* considerably longer, straight, more oblique, uniting with the third branch of the median nervure at a short distance from its base, closing the discoidal cell rather beyond the middle of the wing. *FORELEGS* of the MALE extremely minute, concealed among the hairs of the breast, very densely hairy; the tarsus much shorter than the tibia, and very slender. *Forelegs* of the FEMALE much longer, scaly, slender; the outside of the tibia and tarsus with a few rather long setæ; the tarsus nearly as long as the tibia, scaly, not very distinctly articulated, the extremity armed with fine setæ-like spines. *Four hindlegs* moderately long, slender, scaly; femur clothed within with long hairs; tibia armed with a few spines, those on the sides beneath forming rows; tarsus nearly as long as the tibia, more thickly and irregularly spined; *claws* simple; *pulsilli* very minute."

"LARVA rather robust, finely pubescent, longitudinally striated; head small; tail pointed, bifid." (*Westwood*, l c)

Erebia is distinguished from the preceding genera by having the wings much rounded in outline, also the costal nervure alone is dilated at the base; and the outer margin is very convex, entire, or scarcely perceptibly sinuate. The colour in the Indian species is velvety blackish-brown on the upperside, with ferruginous or ochreous patches on the disc; and on the underside the hindwing is very thickly clothed with scales and short hairs, dark brown irrorated with greyish throughout, and having a complete discal row of white spots. The structural differences between it and the following genus *Callierbia* are very slight, but there is a well-defined character in the markings so far as our Indian species are concerned; in all the Indian *Erebius* the ferruginous patches are more or less present, the apical ocellus of the forewing is round, and has a single white pupil on the upperside, sometimes very prominent, (occasionally two on the underside in *E. shallada*), and the hindwing is without ocelli of any kind either on upper or underside. In the Indian *Callierbias* the ferruginous patches are never present on the upperside, though the ocelli have often ferruginous irides; the apical ocellus of the forewing is oval and hipupilled on both sides even when least prominent; and the hindwing has almost universally a subanal ocellus on the upperside, and one or more on the underside. The MALE insects have no sexual patches or tufts of hair on the wing. *Erebia* is a Palearctic genus, of which numerous species occur in Europe and Northern Asia, but only three species occur in India, and these are only found within our limits in the Western Himalayas. In habits they frequent forests and bare grassy slopes at from 6,000 to 14,000 feet elevation, and have a weak flapping flight, with an irregular pitching action.

Key to the Indian species of *Erebia*.

A. Upperside velvety brown, with ferruginous or ochreous discal patches; the apical ocellus of the forewing round, with a single pupil: no ocelli on the hindwing on upper or undersides.

a. The ferruginous patches of the upperside diffused.

α¹. The patches large and including the ocellus on the forewing, the ocellus with distinct fulvous iris.

232. *E. KALINDA*, Western Himalayas.

β¹. The patches small on both wings and very dark ferruginous, well removed from the ocellus on the forewing; the ocellus with the iris obsolete or indistinct.

233. *E. SHALLADA*, Western Himalayas

The patch of the forewing paler and ochreous, very large and well-defined; no patch on the hindwing.

234. *E. MANI*, Ladak.

232. *Erebia kalinda*, Moore.

E. kalinda, Moore, Proc Zool Soc Lond, 1865, p. 502, n. 92, pl. xxx, fig. 5, female.

HABITAT: Western Himalayas.

EXPANSE: 1.85 to 2.1 inches.

DESCRIPTION: "FEMALE: UPPERSIDE greenish velvety brown, both wings with a ferruginous discal patch, that on the forewing being subapical. Forewing with an apical black spot, having a white pupil and yellow iris. UNDERSIDE dull brown. Forewing as on upperside, but the ferruginous colour extending anteriorly across the discoidal cell, hindwing with a submarginal series of white dots; the ferruginous patch obsolete." (Moore, l. c.) "The MALE differs from the female in being somewhat smaller, the wings rather narrower, and the exterior margin of the forewing less rounded. The ferruginous patch on the UPPERSIDE of the hindwing is obsolete, or nearly so, in some specimens. The cilia are long and alternately white and brown (in both sexes)." (Lang in epis.) It is also a much darker insect, the ground-colour of the female being pale brown.

The type specimens were taken by Colonel A. M. Lang, R.E., who recorded the following note: "*E. kalinda* is local, and I saw very few, at two places on the hill-sides below the Runang and Werang passes, not at the summit of the pass, but some 2,000 feet lower down. It has a weak low flight among the grass and flowers. The perfect insect appears in June and July at 12,000 to 13,000 feet altitude below the melting snow on the passes in Upper Kunawar." Mr. A. Graham Young has taken it in the Kulu valley in May, Mr. de Nicville took numerous males and one female at Ulwas in May, and Mr. Robert Ellis and Dr. Hutchison took numerous specimens of both sexes in Pangri in June and July at altitudes of 9,000 feet and upwards. Mr. A. G. Butler, in writing on Dr. Watts' collection (Proc Zool Soc Lond, 1880, p. 147), notes that *E. kalinda* was taken "in pine forests in the Ravi basin up to 12,000 feet."

233. *Erebia shallada*, Lang (PLATE XV, FIG. 42 ♂).

E. shallada, Lang, Journ. A. S. B., vol. xlix, pt. II, p. 247 (1880).

HABITAT: Western Himalayas.

EXPANSE: 2.0 to 2.3 inches.

DESCRIPTION: MALE UPPERSIDE, both wings uniform dark velvety brown, with a small diffused dark ferruginous patch within the middle of the exterior margin, and placed between the third and first median nervules in the forewing, but reaching the discoidal nervule in the hindwing. Cilia whitish, marked with brown at the ends of the nervules. Forewing with a subapical black ocellus having one prominent white pupil, and usually with no more. UNDERSIDE: Forewing dark ferruginous with brown margins, greyish at apex, the subapical ocellus larger than on the upperside, black, with one, sometimes two, pupils, one central, the other when present below it and much smaller, and a narrow yellowish iris. Hindwing dark brown, finely mottled with a lighter tint, with a submarginal row of eight white dots. The colour and markings of the underside of the hindwing are almost identical in all the three Indian species of *Erebia*. "FEMALE more rounded in outline than the male, especially the exterior margin of the forewing. UPPERSIDE as in the male, but the brown ground colour paler, the ferruginous patches lighter and more diffused, the subapical ocellus larger, more distinct, and with two white pupils, one central, the other below it, and smaller. UNDERSIDE as in the male. Forewing with the ocellus larger and brighter coloured. Hindwing with a narrow sinuous transverse discal band of brighter brown." (Lang in epis.)

E. shallada is commoner, and extends to lower elevations than *E. kalinda*; it is rather larger, and the male broader winged; it is darker and less brightly coloured, and approaches the *Callerebias* in appearance, especially in the darker more uniform tone, and in the occasional presence of a second white pupil in the ocellus.

Colonel Lang notes that "it appears to be very local; during three or four years collecting in Kunawar I only twice met with it, taking only five specimens, once at 6,000, and again at

8,000 feet altitude, on grass-covered and rocky slopes above the Sotlej in June." Since then Mr. de Nicéville has taken a large number at Ulwas in company with *E. kalinda* in May; he also found it during that month exceedingly plentifully along all the roads in the station of Dalhousie, and through the thick forest as far as Kujiar. Major C. H. T. Marshall found it commonly at Kujiar near Dalhousie and at other places in the Chumba State in May; and Mr. A. Graham Young took it in Kulu in May and July.

The figure represents a male specimen, taken in Kulu by Mr. A. Graham Young, showing both upper and undersides.

234. *Erebia mani*, de N. (PLATE XV, FIG. 43 ♂).

E. mani, de Nicéville, Journ. A. S. B., vol. xlix, pt. ii, p. 247 (1880.)

HABITAT: Chung Pass and Lingti, Ladak.

EXPANSE: 2'0 to 2'1 inches.

DESCRIPTION: MALE: UPPERSIDE, both wings dusky brown. *Cilia* gray at the interspaces. *Forewing* with a somewhat square bright ochreous patch, bounded inwardly above by the disco-cellular nervules, below which it extends in an almost straight line to below the first median nervule, where it becomes merged into the ground-colour; outwardly it almost follows the curve of the wing, but the ground-colour beyond is slightly wider at the apex; anteriorly it is bounded by the subcostal nervule. It bears a large round black spot, with an iris of a slightly lighter colour than the ground, and a minute white pupil. *Hindwing* immaculate. UNDERSIDE: *Forewing* with the discal patch more diffused, extending into the cell, and thickly irrorated with deep ferruginous scales, especially that portion in and just beyond and below the cell. The iris of the black spot is wider and lighter than above. The apex and outer half of the costa thickly irrorated with grey scales, as is also the *hindwing* throughout, which also bears a submarginal series of seven or eight small white dots. FEMALE with both the ground-colour everywhere, and the discal patch on the *forewing* slightly lighter; the grey portions of the *cilia* more prominent.

Mr. de Nicéville took six males and two females on the Chung Pass, on July 10th, and one female at Lingti on the 16th, all at high elevations.

Of the species of *Erebia* occurring in Central and Western Asia beyond our limits, *E. maracandica*,* Erschoff, is the only one which approaches the Indian group. This species is closely allied to *E. kalinda*, but appears to differ in having the ocellus on the *forewing* on both sides very much smaller, and the underside much more uniform in colouration, the *hindwing* lacking the greyish irrorations, and the *forewing* the dark ferruginous patch which covers almost the whole wing in *E. kalinda*.

Erebia turanica, Erschoff, is figured by Serge Alphéraky, (Hor. Soc. Ent. Ross., vol. xvi, p. 413, pl. xv, fig. 22 (1881), and is of very different aspect. It is a dark brown insect of uniform colouration on both sides; the UPPERSIDE with a discal row of three yellow spots on the *forewing*, the first just beyond the cell large and divided by the lower discoidal nervule, the other two smaller, one on each median interspace; and on the *hindwing* a submarginal row of five smaller yellow spots, one on each interspace from the apex. The UNDERSIDE is similar, but it has in addition on the *hindwing* a prominent pure white discal band outwardly dentate, inwardly even and macular towards the costa; also a small white spot near the end of the cell, and another below it. It is said to be very common everywhere between 3,000 and 10,000 feet altitude during the summer in the Tian-chian mountains.

Erebia kalmuka, Alphéraky, is figured and described in the same work (p. 414, pl. xv, figs. 18 ♂, 19 ♀), and is again of a totally different aspect. DESCRIPTION: "UPPERSIDE brownish-fuscous. *Forewing* with the costa, apex, disco-cellular nervules, and outer margin, and *hindwing* with outer margin, narrowly-irrorated with whitish (less densely in the female).

* *E. maracandica*, Erschoff. The male is described and figured in Erschoff's Lepidoptera of Turkestan p. 17, n. 56, pl. i, fig. 23 (1874). DESCRIPTION: "UPPERSIDE fuscous. *Forewing* with a large outer patch marked with a black ocellus with a white pupil. *Hindwing* with an outer patch, fulvous. UNDERSIDE, both wings fuscous. *Forewing* fulvescent at the base. *Hindwing* with a transverse outer series of whitish dots." (Erschoff, l. c.)

UNDERSIDE of the MALE. *Forewing* chestnut, the costa, the outer margin, and the disco-cellular nervules irrorated with silvery-whitish scales. *Hindwing* powdered with greyish-silvery throughout. Of the **FEMALE** the *forewing* is paler, the *hindwing* brownish-grey with whitish nervules." (*Alphéraky*, l. c.) Found from 9,000 feet elevation up to the limit where vegetation ceases in the mountains near Koltja.

Erebia sibo, *Alphéraky*, is also figured and described in the same work (p. 416, pl. xv, figs. 20 ♂, 21 ♀). It is found in the same mountains, and somewhat resembles *E. kalmuka* in aspect, both species being totally devoid of ocelli or white dots of any sort on either wing on either surface, but is rarer and more local. **DESCRIPTION**: "Wings rounded, costa arched. **MALE** much larger, the wings more ample. **FEMALE** with the wings narrower. **UPPER-SIDE** fuscous, between the nervules chestnut towards the outer margin. **UNDERSIDE** of the **MALE**. *Forewing* chestnut, with black nervules. *Hindwing* greyish-fuscous, with ashy nervules, three undulate arched streaks fuscous, one subbasal, one median, and one before the margin, of which the last two unite above the anal angle. Of the **FEMALE**, very different from the male. *Forewing* dilute brownish-grey, with a submarginal and a median series of dots, and the basal dots, irregular, brown, [in the figure the basal area is darker, defined by a dark lunulate median streak, beyond which is another lunulate dark submarginal streak]. *Hindwing* brownish-ashy, the nervules paler, a broad median fuscous fascia, everywhere irregularly defined with fuscous, and a submarginal series of angulate marks brownish-fuscous."

In a paper on the Lepidopterous fauna of Transcaucasia* *Lederer* notes the occurrence of the following species of *Erebia* in the tract dealt with:—*E. tyndarus*, *Esper*; *E. pronot*, *Esper*; *E. heuritsoni*, *Lederer*; *E. ligea*, *Linnaeus*; and *E. afra*, *Fabricius*; also of *E. melanholica*, *Herrich-Schäffer*. Of the last we have no figure or description available; the other five belong to a different section of the genus which is numerously represented in Europe, and in which the characteristic colouring is dark brown with an incomplete rather narrow ferruginous band on each wing bearing a series of ocelli; of course the extent to which these characters are present and developed varies greatly in the various species. It is very unlikely that any *Erebias* of this section of the genus will be found to occur within our limits.

Genus 25.—CALLEREBIA, Butler. (PLATE XV).

Callerebia, Butler, Ann. and Mag. of Nat. Hist., third series, vol. xx, p. 217 (1867).

"Very similar to *Erebia*; differs in the form and markings of the wings, the anal angle of the *hindwing* being frequently produced and lobe-shaped; also in the more slender antennæ less distinctly clavate, and in the more angulate palpi. Otherwise as in *Erebia*." (*Butler*, l. c.)

Callerebia is apparently almost exclusively confined to the Himalayas and out-lying ranges; a single species occurs in the Khasi hills, and one species has been described from Moupin in Thibet, all the rest occur in the Western Himalayas, some of them extending to the Eastern Himalayas as far as Nepal. They affect lower elevations than the *Erebias* do, and are common in the outer ranges at 6,000 feet altitude; they differ in colour and markings from the *Erebias*, as pointed out above; and are sombre brown insects with weak pitching flight and similar habits, but are more frequently found in shady places and among the undergrowth in forests; they all have a bipupilled ocellus on both sides of the *forewing*, and at least one subanal ocellus with a single pupil on the *hindwing*, except occasionally in *C. scanda*; on the underside of the *hindwing* also at least one of the submarginal dots, and often several of them, are developed into ocelli, except occasionally in *C. oriza*. Nine species or varieties have been described; all of them are more or less variable in their markings, and all are closely allied to each other, many of them being very doubtfully distinct. The male insect has no sexual patches or tufts of hair on the wings, and the sexes are but very slightly differentiated in colour and markings; the females chiefly differ in the somewhat broader and more rounded outline and the slightly paler tone of colouration. When the specimens of this genus are fresh and newly emerged from the chrysalis, they are beautifully glossed with deep blue in some lights.

C. scanda is quite distinct, and so also is *C. orixa*, the only species found in the Khasi hills. *C. annada*, *C. hybrida* and *C. nirmala* can typically be easily distinguished, but there are numerous intermediate forms. Typical *C. hybrida* can be distinguished from *C. annada* by the shape of the wings, from typical *C. nirmala* it may be known by the far greater prominence of the discal and submarginal brown lines of the underside, and in having only two ocelli near the anal angle. *C. intermedia* and *C. cashapa* only differ from *C. nirmala* in the ocellation of the hindwing, and as neither form is at all constant in this respect, and numerous intermediate variations are found linking all three together, they seem to be inseparable as species. *C. daksha*, the smallest of the group, is also closely allied to *C. nirmala*, but the uniform dark brown colour of the underside and the prominence of the white spots render it sufficiently distinct, though it also shows variations in ocellation.

Key to the Indian species of *Callerebia*.

- A Upperside dark brown, with one (occasionally two to five on hindwing) ocellus on each wing, that on the forewing lapulled and oval; no ferruginous patches on either wing.

- a Upperside with the margins of both wings broadly and distinctly paler; underside uniform brown; hindwing with the inner half only densely irrorated with pure white, two prominent subanal ocelli and four white spots in a submarginal series, but no transverse dark lines.

235 *C. SCANDA*, Western Himalayas.

- B Upperside almost uniform brown.

- a¹ The ocellus of the forewing widely encircled with bright fulvous in upper and undersides. The underside tinged throughout with fulvous; hindwing with the white irrorations interrupted with numerous fulvous brown undulated stripes; the two subanal ocelli small and blind or wanting, the white spots also wanting.

236 *C. ORIXA*, Khasi Hills.

- a² The ocelli all with narrow ridges on the upperside.

- a³ Underside brown; hindwing with grey irrorations throughout and crossed by more or less distinct submarginal and median sinuate brown lines, between which and on the inner margin the grey irrorations are denser, sometimes also a subbasal line; the white spots often obsolete, the two subanal ocelli prominent but often blind.

- a⁴ Forewing elongate, outer margin nearly straight.

237 *C. ANNADA*, Western Himalayas.

- b¹ Forewing short, outer margin convex.

238 *C. HYBRIDA*, Western Himalayas.

- b² Underside greyish brown; the disc of the forewing maroon; hindwing with the grey irrorations very fine and indistinct, with little or no trace of brown lines or undulations, the ocelli round, the four white spots present and irregularly developed into ocelli, often more than one ocellus on the upperside of the hindwing.

239 *C. NIRMALA*, Western Himalayas.

C. intermedia, Western Himalayas.

C. cashapa, Western Himalayas.

- c² Underside uniform dark brown, with no white irrorations; hindwing with the white spots prominent and irregularly developed into perfect ocelli.

240 *C. DAKSHA*, Western Himalayas.

235 *Callerebia scanda*, Kollar.

Erebia scanda, Kollar, in *Himal. Käschmir*, vol. iv, pt. ii, p. 452, pl. xvii, figs. 3, 4 (1844), *Callerebia scanda*, Butler, Ann. and Mag. of Nat. Hist., third series, vol. x, p. 217, t. 1 (1867).

HABITAT. Western Himalayas.

EXPANSE. 2.0 to 2.3 inches.

DESCRIPTION: "Wings entire, rounded. UPPERSIDE fuscous-black. Forewing with a black ocellus near the apex on both sides, bordered with ferruginous, and with two white pupils. Hindwing with one ocellus near the anal angle on the upperside, and two on the underside, pupilled with white. UNDERSIDE. Both wings paler, the hindwing irrorated with white."

"The upperside is black-brown, a little lighter towards the anterior and exterior margins; the ocellus of the *forewing* is oblong *Hindwing* with a lighter marginal hue. **UNDERSIDE** with four white dots in an arched line above the ocelli." (Kollar, 1 c)

We have never seen the **FEMALE** of *C. scanda* Kollar's description of it is appended for reference, * but he seems to have described a female of *C. annala* by mistake. These *Callerebia* were at that time hardly known at all, and the specimens available for examination were few in number: to judge from analogy the female of *C. scanda* will be found to differ but little from the male in colour or style of markings.

C. scanda is a very distinct species and shows little variation. The chief distinguishing features are—on the upperside the paling of the outer margins, and on the underside the absence of the ferruginous tint on the disc of the *forewing*, the concentration of the white irroration on the inner half of the *hindwing*, and the presence of the four submarginal white dots above the ocelli. The only variation worth noticing is in the occasional disappearance of the single ocellus on the upperside of the *hindwing*. In shape it corresponds with *C. nirmala*, but it has the outer margin of the *forewing* more convex.

"This species appears in the height of the rainy season (July and August) about the hedges and banks in lower Kumawar at 6,000 to 7,000 feet altitude. Good fresh specimens are of a velvety black brown on the upperside, and on the underside have the *hindwing* very whitely salted, so that as they fly they look distinctly parti-coloured." (Colonel A. M. Lang R.E., in Proc. Zool. Soc. Lond., 1865, p. 501). *C. scanda* is common throughout the outer ranges of the Western Himalayas, as far east as Mussoorie, and is probably found in Kumaon, but we have no record of its occurrence further east. Our collections contain only specimens from Pangri taken by Mr. Robert Ellis, from Simla and from Mussoorie.

236 *Callerebia oriza*, Moore.

C. oriza Moore. Proc. Zool. Soc. Lond., 1872, p. 555.

HABITAT Khari Hills, Manipur.

EXpanse 22 to 24 inches.

DESCRIPTION "MALE **UPPERSIDE** dark chocolate velvety brown, with an indistinct narrow submarginal black line. *Forewing*, with a large subapical ocellus, composed of a round black spot, encircled by a broad bright ferruginous ring, and central with two white dots. *Hind wing*, with a small similar ocellus near the anal angle. **UNDERSIDE** brighter brown. *Forewing* mottled at the apex, the ocellus as above, with a posterior dusky border. *Hindwing* with numerous greyish-white transverse short strigæ, which are most numerous from the abdominal margin and less frequent before and below the apex, two very small contiguous anal black spots encircled by a ferruginous ring, each without a central white dot."

"This species may be known from *C. annala* by the ocellus on the *forewing* being twice as large, much more prominent, and brighter-coloured." (Moore, 1 c)

C. oriza is also a very distinct species, isolated in its geographical range from the rest of the genus. The **FEMALE** is unknown, but it probably differs very slightly, if at all, from the male. We have specimens taken by Mr. A. O. Hume in the eastern hills of Manipur in May, and others taken by Dr. E. R. Johnson at Shillong in May and June, and at Terria Ghat below Shillong in the autumn.

237 *Callerebia annala*, Moore.†

Frebia annala, Moore. Horsfield and Moore, Cat. Lep. E. I. C., vol. 1, p. 227 (1837); *C. scanda*, var. 6, Butler. Ann. and Mag. of Nat. Hist., third series, vol. xx, p. 217, pl. iv, fig. 8.

HABITAT The Himalayas, from Kashmir to Bhutan.

EXpanse : 24 to 28 inches.

* *Callerebia scanda*. The **FEMALE** is somewhat larger, the *hindwing* perceptibly lobed at the anal angle, the white pupils of the ocelli absent on both sides, or very indistinct. **UNDERSIDE** *Hindwing* with the white irroration less distinct, the four white dots above the ocelli wanting. (Kollar, 1 c)

† The figure (plate xv, fig. 44) which is named *C. annala* on the plate really represents *C. hybrida*, the next species, which had not been discriminated when the plate was printed.

* DESCRIPTION: "Differs from *Erebia* [*Callerebia*] *scanda* in being larger, and in having the anal angle more falcated. On the UNDERSIDE, the *forewing* is of a bright ferruginous; the *hindwing* is mottled with white nearly throughout, and from near the anal angle, below the ocelli, extends a curved white line." (Moore, l. c.)

C. annada is the largest species of the genus, and has the *forewing* most elongate, the outer margin being oblique and almost straight, sometimes slightly concave; it most nearly approaches *C. orixa* both in outline and markings, and also geographically in its range.

The ferruginous tint of the UNDERSIDE of the *forewing* is very bright in specimens from the Eastern Himalayas; in those from the Western Himalayas it is much less pronounced, except on a discal patch which includes the ocellus, and is outwardly more or less distinctly margined with fuscous. On the *hindwing* the white mottlings are not uniformly spread as in *C. scanda*, but are distinctly grouped into undulated striæ, as in *C. orixa*; and there usually is no trace of the four submarginal white spots; the "curved white line" mentioned above is nebulous and composed of these same whitish irrorationes. In typical specimens there are no distinctly formed transverse dark lines, but at the places they should occupy the whitish irrorationes are less dense, showing more of the ground-colour; in other specimens the lines are distinctly formed, the submarginal one lunulate and ending before the ocelli, the median one highly and irregularly sinuated, the subbasal one scarcely traceable in any. The ocelli at the anal angle are somewhat misshapen and placed obliquely, that at the anal angle being nearest to the margin; and both are almost always blind, though occasionally with small papilli even in typical specimens. The FEMALE is rather larger and paler coloured, but does not otherwise differ from the male.

C. annada is probably not uncommon, but we have few specimens in our collections. Colonel A. M. Lang, R.E., took it in Lower Kunawar, and Mr. Hocking in the Kangra District; Major C. H. T. Marshall took it in the Chumba State in May; and Mr. de Nicéville at Simla; the type was taken in Bhutan. The Indian Museum has a specimen from Nepal, and it probably is to be found in all the intermediate region, occurring in the rainy season.

238. *Callerebia hybrida*, Butler. (PLATE XV, FIG. 44 ♂.)

C. hybrida, Butler, Proc. Zool. Soc. Lond., 1880, p. 147, n. 4, *C. nada*, Moore, Trans. Ent. Soc. Lond., 1881, p. 206.

HABITAT: North-Western Himalayas.

EXPANSE: ♂, 2.0 to 2.4; ♀, 2.5 inches.

DESCRIPTION: "Dr. Watt obtained a series of a *Callerebia* exhibiting intermediate forms between *C. annada* and *C. nirmala*. In the colouration of the UNDERSIDE of the *forewing* they agree almost entirely with *C. nirmala*, but show the submarginal stripe strongly as in *C. annada*; on the *hindwing* they are coloured like *C. annada*, but have rounded ocelli varying in number from two to five. In expanse they are intermediate, and therefore correspond with *C. scanda* in this respect." (Butler, l. c.)

From the above description *C. hybrida* would seem to be nearest allied to *C. nirmala*, but it is really most closely allied to *C. annada*. The original description of *C. nada*, which is appended below for reference,† gives a far more accurate idea of this species than Mr. Butler's description of *C. hybrida* does; we have never seen any specimen with more than two ocelli on the hindwing that could be separated from *C. nirmala*, and had not Mr. Moore recently admitted (Proc. Zool. Soc. Lond., 1882, p. 237), that his *C. nada* is identical with *C. hybrida*, we should have retained this species under the name of *C. nada*, Moore, and placed *C. hybrida*, Butler, as a variety of *C. nirmala*.

* Erroneously named *C. annada* on the plate.

† *Callerebia nada*, Moore. HABITAT: KUNAWAR. EXPANSE: male, 2.00; female, 2.50 inches. DESCRIPTION: "MALE and FEMALE. Nearest to *C. annada*. Exterior margins of both wings more convex. UPPERSIDE similar, the ocellus of the *forewing* comparatively more rounded. UNDERSIDE similar; *forewing* with the reddish patch somewhat broader, and extending to below the lower median nervule; *hindwing* with less prominent grey stripe; the transverse zig-zag brown line distinctly formed and more erect, the two subanal ocelli larger and white pupilled; above these there is an indistinct row of white spots." (Moore, l. c.)

Typical *C. hybrida* is readily distinguished from *C. annada* by the shape of the forewing, and generally also by the markings of the hindwing, though these latter are variable and show gradations between the two species. There is no discernible difference in the shape of the ocellus of the forewing on the upperside (but the iris is less prominent), nor in the extent of the reddish patch on the underside; but on the **UNDERSIDE** of the *hindwing* the whitish irrorationes are less distinct and much less prominently grouped into undulated striæ; the transverse lines are almost always distinct, and the median line is more regularly sinuate and subparallel with the outer margin; the white submarginal spots are almost always present; the subanal ocelli are shaped and placed as in *C. annada*, but are almost always distinctly pupilled with whitish. Two very remarkable specimens taken in Kulu by Mr. A. Graham Young have the ocelli quite blind, and the markings altogether almost exactly as in *C. annada*, but the shape of the wings shows conclusively that they belong to this species, *C. hybrida*.

C. hybrida is very common in the Western Himalayas throughout the outer ranges at moderate elevations from May to September; we have no specimens from further east than Mussoorie, but it probably extends to Kumaon even if not still further eastwards.

239 *Callerebia nirmala*, Moore.

Erebia nirmala, Moore, Proc. Zool. Soc. Lond., 1865, p. 501, n. 91; *Callerebia intermedia* and *C. cashapa*, Moore, id., 1882, p. 236; *C. scanda*, var. c, Butler, Ann. and Mag. of Nat. Hist., third series, vol. xx, p. 217, pl. iv, fig. 9 (1867).

HABITAT: Western Himalayas.

EXPANSE: 2'0 to 2'4 inches.

DESCRIPTION: "MALE: **UPPERSIDE** uniform dark brown. *Forewing* with a subapical black ocellus, having two white pupils and a dark ferruginous iris. *Hindwing* with a similar but single-pupilled ocellus near the anal angle. **UNDERSIDE** greyish brown, discal portion of *forewing* maroon-brown, ocelli of *both wings* as above, but with the irides yellow; a white dot below the ocellus of the *forewing*, and a discal series of four white dots anterior to the ocellus of the *hindwing*. *Cilia* brown."

"**Remark.**—Allied to *E. scanda*, Kollar, but differs in having a somewhat more elongated forewing. On the underside it may be distinguished by the absence of the numerous white striae on the hindwing, and by there being a *single ocellus* only near the anal angle." (Moore, l. c.) The **FEMALE** is similar to the male, but a little larger and paler.

Var. *intermedia*, Moore. **HABITAT:** Kangra district. **EXPANSE:** ♂, 2'1; ♀, 2'4 inches. **DESCRIPTION:** "Intermediate between *C. nirmala* and *O. cashapa*. **UPPERSIDE** similar to *C. nirmala*, with one ocellus only on each wing. **UNDERSIDE** with two lower ocelli, a third ocellus between the third median and discoidal nervules, and two small apical spots above." (Moore, l. c.)

Var. *cashapa*, Moore. **HABITAT:** Dharmasala, Mussoorie, Simla. **EXPANSE:** 2'0 to 2'2 inches. **DESCRIPTION:** "Allied to *C. nirmala*. **MALE** and **FEMALE** comparatively larger in size. **UPPERSIDE** similar, but the *hindwing* having three well-formed ocelli, the one between the discoidal and third median nervules sometimes absent. **UNDERSIDE:** *Forewing* less brightly chestnut-coloured. *Hindwing* with a complete series of ocelli, one between each pair of nervules; some specimens with three anterior and two posterior ocelli; the upper one and sometimes the lowest being minute." (Moore, l. c.)

Typical *C. nirmala* most nearly resembles *C. hybrida* on the upperside, being almost uniformly dark brown throughout, but the ocelli are smaller and the irides fainter still; it is also as a rule a smaller insect. On the underside its aspect is very different, the *forewing* is much more uniform in colour, and usually strongly tinged with maroon brown, the outer zone of the ocellus very indistinct; on the hindwing the greyish irrorationes are very fine and indistinct; the transverse lines are indistinct or totally wanting, and the ocellus is quite round, with a very distinct iris and outer ring. The variation in the ocelli is inadequately represented in the varieties above described, as there are numerous gradations between each

of these forms. The typical arrangement on the underside of the hindwing is one perfect subanal ocellus, and three white submarginal dots from the costa. Next we find a second subanal ocellus developed, and then a fourth white spot completing the series; and of this series, with the single exception of the upper subanal ocellus on the lower median interspace, which is constant, the whole of the spots vary at random; sometimes one, sometimes another, is totally absent, or on the other hand developed into a perfect ocellus; the number of perfect ocelli varies from one to six; where there are two only it is sometimes the third and fifth, sometimes the fifth and sixth; where there are three, it may be the third, fifth and sixth, or the second, third, and fifth, and so on. There are also sometimes one, sometimes two, ocelli below the subapical ocellus on the underside of the forewing. On the upperside of the hindwing there is typically only a single ocellus corresponding to the constant fifth of the underside; often a second is developed corresponding with the third in series, sometimes a third corresponding with the sixth, and occasionally, though rarely, the whole series of six is developed. If there is more than one ocellus on the upperside there are usually (but not always) at least four on the underside; and wherever the series is complete on the underside, more than one is almost invariably developed on the upperside.

C. nirmala in all its forms is very common at moderate elevations throughout the Western Himalayas from May till September. It affects the undergrowth in glades in forests, and may be seen on the wing even on damp and cloudy days.

240. *Callerebia daksha*, MOORE.

C. daksha, Moore, Proc. Zool. Soc. Lond., 1874, p. 266, pl. xlii, fig. 1.

HABITAT: Kashmir.

EXpanse: ♂, 1·75 to 2·15; ♀, 1·87 inches.

DESCRIPTION: "MALE and FEMALE: UPPERSIDE dark brown. Forewing with a small subapical black-bipupilled ocellus. Hindwing with a smaller subanal black spot, having a single white pupil, a white dot beyond it on the middle of the disc, some specimens showing also an intermediate dot. UNDERSIDE slightly paler, but uniform brown. Forewing with a pale ferruginous ring encircling the subapical ocellus, beneath which is a minute white dot. Hindwing with a pale ferruginous ring encircling the subanal black spot; a minute anal and a transverse discal series of five prominent white dots, which in some specimens appear on a black spot with a ferruginous ring."

"This is the smallest species of the genus yet described, and may be distinguished on the upperside by the absence of the ferruginous ring round the ocellus, on the underside by being of an uniform colour and without mottlings on the hindwing." (Moore, l. c.)

C. daksha is a comparatively rare insect, and appears to be local. The type specimens were taken at Goolmurg, 9,000 to 10,000 feet altitude. Mr. de Nicéville took a single specimen at Gond also in Kashmir; and Mrs. Bazett took a large number at Katabal near Goolmurg, at 8,000 to 9,000 feet altitude in June; but we have no other records of its capture. The development of the ocelli on the underside of the hindwing varies as in *C. nirmala*, but the white spots are generally much more prominent. It is also variable in size.

Genus 26.—ZIPETES, Hewitson. (PLATE XVII.*)

Zipetes, Hewitson, Ex. Butt., vol. iii, p. 100 (1863); *Zibetes* or *Zipetes*, Wood-Mason, Journ. A. S. B., vol. i, pt. ii, p. 86 (1881), note.

"BODY small, hairy. Eyes small, smooth. Antennæ slender, short, slightly thicker from the middle to the tip; the articulations short, easily seen. Palpi long, compressed, thickly clothed with long hair; the last joint scarcely seen. FOREWING with the costal margin arched, the apex rounded, the inner margin nearly straight. Costal nerve alone swollen at the base, reaching the middle of the wing. Subcostal nerve with four branches, equi-distant; two before the end of the discoidal cell. The discoidal cell half the length of the wing, closed; upper disco-cellular nervule very short, the middle one half as long as the

* ZIPETES, erroneously spelt ZIPARTIS on the plate.

lower, slightly curved inwards; the lower one curved outwards, united to the third branch of the median nervure (which joins at an angle) at a distance from its base. HINDWING with the costal nervure joining the margin at the middle of the wing; subcostal nervure with its first branch arising at its middle; the discoidal cell closed obliquely; the upper disco-cellular nervure arising at a short distance below the first branch of the subcostal nervure; the lower one twice its length, joining the third median nervure at a short distance from its base." (Hewitson, l. c.)

Zipetes is very closely allied to *Callerebia*; structurally indeed they are almost identical, but in style of markings they differ considerably. In *Zipetes* there are no ocelli on the upperside, but on the underside on the hindwing the ocelli are very large, irregular, and enclosed in brilliant silvery bands. The male has no sexual patches or tufts on the wings, and the sexes are similar in colour and style of markings.

Only two species of *Zipetes* are known, both of them Indian—one from North-Eastern India, and the other from the hills of South India. Neither of them appear to be very common.

Key to the species of *Zipetes*.

- A Upperside dark brown, with no ocelli, UNDERSIDE, hindwing with the ocelli large irregular, and enclosed by brilliant silvery bands.
 - a Both wings with a broad transverse white band, the ocelli of the hindwing enclosed by silvery bands in two groups.
 - 241 *Z. SATYRIS*, South India.
 - b Dark brown, paler at the margins, but no white bands, the ocelli of the hindwing enclosed by silvery bands in a single group.
 - 242. *Z. SCYLAX*, North East India

241. *Zipetes satyris*, Hewitson. (PLATE XVII, FIG. 58 ♀.)

Zipetes satyris, Hewitson, Ex. Butt., vol. iii, p. 100, pl. *Hypocista* and *Zipetes*, fig. 6 (1863), male.

HABITAT: Hills of South-India.

EXPANSE: ♂, 2'3 to 2'5; ♀, 2'5 to 2'7 inches.

DESCRIPTION: "MALE: UPPERSIDE dark brown. Both wings crossed beyond the middle by a band of white. UNDERSIDE as above, except that the hindwing is crossed by a band of five ocelli [within the white band], with white pupils and rufous iris, bordered with silver; the first, fourth, and fifth small, the second large and with two pupils, the third half its size." (Hewitson, l. c.) The silver border encloses the first and second ocelli in one group, and the third, fourth, and fifth in another. The FEMALE is paler in colouration, larger, the white bands wider, and with the wings somewhat broader.

We have as yet only received *Z. satyris* from Mr. Harold Fergusson, who took it in May and June at Mynall in the Ashambo hills in Travancore at an altitude of 2,600 feet. It is also found in the Nilgins and the Wynnad, and probably in the other hill ranges in the south of the Peninsula, but appears to be nowhere common.

The figure shows the upper and undersides of a female specimen from the Ashambo range in Travancore in Major Marshall's collection.

242. *Zipetes scylax*, Hewitson. (PLATE XVII, FIG. 62 ♀.)

Zipetes scylax, Hewitson, Ex. Butt., vol. iii, p. 100, pl. *Hypocista* and *Zipetes*, fig. 7 (1863).

HABITAT: Naga hills, Sylhet, Sikkim.

EXPANSE: 2'3 to 2'4 inches.

DESCRIPTION: "UPPERSIDE dark brown, paler towards the margins; the outer margins rufous, traversed by a submarginal black line. UNDERSIDE as above, except that there are two submarginal lines of black; that the forewing has a band of five small ocelli, the pupils blue, the iris rufous; and that the hindwing has a band of five ocelli, the pupils blue, the iris rufous; the first, fourth, and fifth small, the fourth oval with two pupils, the third large, all surrounded by a common band of silver." (Hewitson, l. c.) There is also a less brilliant silver band

on the forewing on the inner side only of the series of ocelli. The FEMALE is similarly coloured and marked, but larger, paler, and with broader wings; the submarginal dark lines are also both visible on the upperside in both sexes.

Z. scylax is rather a rare insect; it was originally recorded from Sylhet, but has not since been obtained from that district. Mr. Otto Möller has taken it at moderate elevations in Sikkim, and Mr. de Nicéville met with it in the Great Runjit valley in October, it will probably be found to occur here and there in the lower ranges on the north-eastern frontier of Bengal and Assam.

The figure shows the upper and undersides of a female specimen from the Great Runjit valley, Sikkim, in the Indian Museum, Calcutta.

The remaining genera of this subfamily show an approach to *Elymnias* in the clothing of the palpi, which are provided with a distinct tuft of hairs at the back of the middle joint, where it lies against the face; they are all aberrant, in that the palpi in front are not clothed with long porrect hairs, and in that the nervures of the forewing are not perceptibly dilated at the base. In *Melanitis* and *Hipio* there are no sexual marks on the wings of the male insect; but in both *Cylogenes* and *Parantirrhoea*, there are very remarkable sexual characters. All of them are tropical or sub-tropical insects.

Genus 27.—MELANITIS, Fabricius. (PLATES I and XII).

Melanitis, Fabricius, Illiger's Mag., vol. vi, p. 282 (1807); *Cyllæ*, Boisduval, Voy. Astral., Lep., p. 140 (1832); id., Westwood, Gen. D. L., vol. ii, p. 360 (1831).

"BODY small, weak; wings large; forewing emarginate along the outer margin; hindwing angulated or tailed in the middle of the outer margin. HEAD moderate-sized, hairy, with a broad short tuft in front. EYES prominent, naked. PALPI rather short, compressed, broad, obliquely porrected upwards, the tip not reaching to the level of the top of the eyes; thickly clothed with short scaly hairs lying close together; the back of the middle joint with a thick tuft of hairs extending from the middle to the tip. ANTENNÆ of variable length, slender, terminated by a gradually formed elongate club, scarcely thicker than the rest of the antenna. THORAX rather short, compressed, elevated in its hinder portion. ABDOMEN small, or but moderately robust. FOREWING, subtriangular; costal margin [more or less] strongly arched, apex rounded; outer margin [generally, not always] angulated or rather dilated a little below the apex, below which it is emarginate; inner margin nearly straight. None of the nervures dilated at the base; costal nervure extending a little beyond the middle of the costa; subcostal nervure with its branches as in *Lethe*; upper disco-cellular nervure very short, oblique, arising near the middle of the wing; middle disco-cellular short, more transverse; outer disco-cellular long, much curved, the curve being towards the base of the wing, the extremity directed outwards, and uniting with the third branch of the median nervure at about the same distance from its base as exists between the origin of its first and second branches, the third branch angulated at the point of junction with the lower disco-cellular, beyond which it is nearly straight. HINDWING broadly subovate; apex rounded; outer margin scalloped, strongly angulated, or tailed in the middle at the extremity of the third branch of the median nervure. Subcostal nervure nearly straight; costal nervure extending nearly to the apex; subcostal nervure branching at a moderate distance from the base (which is rather nearer the body than the precostal nervure); upper disco-cellular nervure short, curved; lower disco-cellular considerably longer, nearly straight, oblique, uniting with the third branch of the median nervure at a short distance beyond its origin, closing the discoidal cell in an acute point. FORELEGS very minute, clothed with short hairs, not forming a brush; the tibia nearly equal in length to the femur; tarsus about two-thirds of the length of the tibia. Forelegs of the FEMALE rather longer, scaly; the femur clothed with short hairs beneath; tibia and tarsus of nearly equal thickness throughout; the latter obliquely truncate at the tip, with a few minute spines visible at or near the tip beneath, indicating the articulations. Middle and hindlegs of moderate length, slender, scaly; tibiae with a very few very slender spines beneath; tibial spurs small; tarsus with the articulations

very distinct, armed beneath, and at the tips, with rather long fine spines; *claws* curved, *acute*; armed beneath near the tip with a distinct acute tooth, nearly equal in size to the apical tooth of the claw."

"LARVA long, somewhat pisciform, being narrowed behind the head, gradually thickening to the middle of the body, and then gradually acuminate to the tail, which is terminated by two long setose pointed horns; head somewhat heart-shaped, the upper edge armed with two erect obtuse setose horns. PUPA thick, simple; head-case terminated in an obtuse point." (Westwood, l. c.)

Key to the Indian species of *Melanitis*.

A. Underside finely striated throughout, and with distinct black ocelli with white pupils.

- a. Pale brown; the striation of the underside uniform, bold and distinct; the ocelli perfect and prominent; the costa of forewing usually moderately arched; the inner margin rather short. Falcation of the forewing usually prominent; outer margin sometimes straight or slightly concave.

243. *M. LEDA*, India, Ceylon, Burma, Malaya, China.

- b. Dark brown; the striation of the underside irregular, and less distinct on the outer half; the ocelli less prominent; the costa of forewing strongly arched, increasing greatly the breadth of the wing, and the inner margin comparatively longer. Outer margin of forewing entire or only slightly falcated.

244. *M. ASWA*, India, Ceylon, Burma.

M. tristis, India.

M. suydana, Ceylon, Java.

B. Underside very variable but without distinct striation; the ocelli wanting altogether, or where present blurred or irrorated, and indistinct. Falcation of the forewing prominent.

- a. With dull indistinct ferruginous marks on the forewing often entirely wanting; the upperside always dark brown.

- a¹. Upperside very dark brown, ashy at the margins; a dull ferruginous streak from the costa, always indistinct, often obsolete.

245. *M. BELA*, India, Burma.

- b¹. Upperside dusky olive-brown; the apex suffused with dull ferruginous.

246. *M. TAMBA*, Ceylon.

- c¹. Upperside with no trace of ferruginous markings

- a². Upperside with two white spots on the forewing, underside ashy tinged with olive on the basal half; hindwing with a submarginal series of paler spots.

247. *M. VARAHA*, S. India.

- b². Upperside with no white spots on the forewing; underside glossy olive-brown, tinged or irrorated with ashy white on the basal two-thirds; hindwing with a white dot near the anal angle, and another at the end of the cell.

248. *M. GOKALA*, S. India.

- d. With bright ferruginous markings on the upperside of the forewing towards the apex.

- a³. Upperside brown, scarcely irrorated with ashy at the outer margin; the ferruginous mark incompletely encircling a blackish patch with two white spots, and not reaching the costa.

249. *M. ISMENE*, India, Ceylon, Burma, Andaman Isles, Malaya.

- b³. Upperside brighter brown (much darker in the males), more broadly irrorated with ashy on the margin than in *M. ismene*; the ferruginous mark consisting of a streak from the costa, and in the females extending round the black patch, and by suffusion to the outer margin.

250. *M. DUEYODANA*, N. India, Orissa, Burma.

- c³. Upperside brighter brown (darker in the males), the marginal irrorations less prominent; the ferruginous mark a broad diffused subapical band interrupted on its inner edge by a blackish patch usually without white spots.

251. *M. ZEPHYRUS*, India, Burma, Andaman Isles.

- d³. Upperside brown; the ferruginous mark a broad subapical band as in *M. zephyrus*, but without the black patch interrupting it.

252. *M. GNOMPHES*, India.

The most striking feature of the genus *Melanitis* is the extent to which the outer margin of the forewing is falcated or produced into a point below the tip of the lower discoidal nervule; this falcation varies much, being scarcely traceable in some specimens of *M. leda* and *arwa*, but in most of the species it is very prominent. The extreme shortness of the middle discocellular nervule of the forewing is another well-marked character, the two discoidal nervules originating close together just below the subcostal nervule; the nearest approach to this character being in *Rhaphiura*.

The Butterflies of this genus are of dull colouration, and moderately large size; the usual colour is some shade of brown on the upperside, variegated in many species with black and ferruginous towards the apex of the forewing, with one or two white spots; the underside is in some species extremely variable, showing every variety of autumnal tint, and in all cases beautifully harmonising with the dead leaves among which the insects generally settle. They shun the sunshine, and are found in shady forests or secluded spots in gardens, but always under the shade of trees or bushes; they are almost crepuscular in their habits, being active on the wing only towards sunset. They feed on juices, and numbers may be found crowding round slits in the bark of fruit trees when the sap exudes, and where date palms are found they may often be observed in large numbers imbibing the juice of the trees when cut for toddy.

The genus *Melanitis* is widely distributed in the Indian region, one or two species being found commonly almost everywhere; in the hills they do not ascend to any great elevation, and north of the Himalayas they are unknown, but a few species are found in Africa, and others extend through the Malay Archipelago to Australia and China. The great variation shown by these insects renders it difficult to define the species, great differences of opinion on this point have naturally resulted. Mr. Kirby includes the whole of the Indian species as varieties of *M. leda*; but so far as we can see at present there are several quite distinct forms.

243. *Melanitis leda*, Linnæus. (PLATE I).

Papilio leda, Linnæus, Syst. Nat., vol. i, pt. ii, p. 773, n. 151 (1767); id., Drury, Ex. Ins., vol. i, pl. xv, figs. 5, 6 (1773); id., Cramer, Pap. Exot., vol. iii, pl. cxcvi, figs. C, D (1779); *Oreus marmorata leda*, Hbn., Samml. exot. Schmett., vol. i, pl. xci, figs. 1-4 (1806-1816); *Melanitis leda*, Fabricius, Ill. Mag., vol. vi, p. 282 (1807); id., Moore, Lep. Cey., vol. i, p. 15, pl. x, figs. 1, 16, male; 1a, female (1880); id., Distant, Rhop. Malay., p. 41, pl. iv, fig. 10 (1892), male; *Hypio leda*, Hübner, Verz. bek. Schmett., p. 56, n. 538 (1816), *Satyris leda*, Godart, Enc. Méth., vol. ix, p. 478, n. 4 (1819); *Hipparchia leda*, Horsfield, Cat. Lep. E. I. C., pl. viii, figs. 9, larva; 9 a, pupa; 9 b-h, structure of imago (1829); *Cyllo leda*, Butler, Ann. and Mag. of Nat. Hist., third series, vol. xix, p. 51 (1867), id., Hewitson, Journ. Linn. Soc. Lond., Zoology, vol. viii, p. 144 (1864).

HABITAT: Throughout India, Burma, the Malay Peninsula, Ceylon, Andaman Isles, and the Malay Archipelago to China.

EXPANSE: 2.5 to 3.1 inches.

DESCRIPTION: MALE and FEMALE: UPPERSIDE uniform, somewhat pale brown. Forewing with two rounded black spots, the lower the larger, confluent and placed midway between the end of the cell and the outer margin, one on either side of the third median nervule. The lower spot is centred with pure white, the upper one has a somewhat larger white spot on its outer margin. The black spots are very obscurely more or less surrounded with ferruginous, and there is a very diffused black patch between the upper one and the costa, and another similar patch internal to it, extending into the end of the cell, these two patches being divided by a very obscure ferruginous bar. Hindwing with a series of submarginal ocelli, varying in number and distinctness coincident with the ocelli on the underside, black with white pupils and ochreous irides. UNDERSIDE much paler, uniformly striated throughout with darker brown. Forewing with from three to five submarginal ocelli, the one between the upper median nervules always the largest and further removed from the margin. Hindwing with six more or less distinct ocelli, the upper one the largest, the remainder gradually increasing to the fifth which is nearly as large as the first, the sixth at the anal angle smaller, often bipupilled, sometimes geminate; all the ocelli on both wings black with white (sometimes irrorated with blue) pupils, yellow irides, and dark brown outer ring.

Typically there are no fasciæ on the UNDERSIDE, but in some cases the strizæ coalesce into dark bands from the costa of the forewing, the first reaching the outer angle, the second continued as a discal band across both wings, and with other abbreviated and less distinct

bands between; there is every gradation between the two extremes to be found wherever the species exist, but the fasciæ are more highly developed in some specimens from Mhow in Central India, taken by Colonel C. Swinhoe, than in any others that we have seen. On the **UPPERSIDE** some specimens have distinct traces of ferruginous marks on the forewing showing in this feature an approximation to *M. ismenæ*, but in all these cases the markings of the underside are quite sufficient to establish their identity with *M. leda*.

M. leda is extremely common in many parts of the country, and has a very wide range; it is found throughout the plains of India from Travancore to the Punjab, and also in Ceylon, Burma, the Andamans, Malayana and China. It is on the wing more or less throughout the year but is perhaps most common in the autumn. Details of the structure of *M. leda* are given on Plate I, copied from Horsfield's plate.

Var. (a). **UNDERSIDE** with the fasciæ and a distinct suffused marginal band ochreous or ferruginous, the entire basal area also tinged with ochreous or ferruginous, the striation finer and closer but equally uniform, the ocelli much smaller, and many of them often obsolete. This variety has been found in Kulu in the N.-W. Himalayas, in Burma, at Poona in the Deccan, and at Trevandrum in Travancore. It is distinctly intermediate between *M. leda* and some varieties of *M. aswa*, not only in the style of the fasciæ and marginal band, and in the less distinct and prominent ocellation, but also in outline, for it has the costa more strongly arched, and the forewing consequently broader than in *M. leda*, but never so much so as in *M. aswa*, and this and its paler colouration will always serve to distinguish it from *M. aswa* in any of its forms. It appears to be a fairly constant form.

The **LARVA** of *M. leda*, figured in Horsfield's Cat. Lep. E. I. C., pl. viii, fig. 9 (1829) is green, covered with short hairs, and has several longitudinal streaks of a deeper green. According to Colonel Lang it feeds on *Saccharum ravanæ*. The **PUPA** is figured on the same plate (fig. 9a) and is green with yellow markings.

244. *Melanitis aswa*, Moore.

Cylo aswa, Moore, Proc. Zool Soc. Lond., 1865, p. 769; *C. tristis*, Felder, Reise Novara, Lep., vol. iii, p. 464, n. 785 (1867); *Melanitis suydana*, Moore, Horsfield and Moore, Cat. Lep. E. I. C., vol. 1, p. 224, n. 486 (1857).

HABITAT: India, Burma, Ceylon.

EXPANSE: 2.2 to 3.0 inches.

DESCRIPTION: "MALE: **UPPERSIDE** uniform dark brown, without spots or other markings. **UNDERSIDE** brown, uniformly covered with short grey stria. *Forewing* with four or five more or less defined apical ocelli, each composed of a black spot, white pupil, pale ferruginous iris and dark brown outer circle, a marginal band ferruginous brown. *Hindwing* with a transverse discal line and broad marginal band ferruginous brown; a submarginal series of six well-defined ocelli, each composed of a black spot, white pupil, ferruginous iris, and dark brown outer circle." (Moore, l. c.) The **FEMALE** is apparently unknown.

M. aswa may always be distinguished from *M. leda* by the very dark brown colour of the **UPPERSIDE**, and by the peculiar shape of the forewing, the inner margin being long, and the costa highly convex, giving great breadth to the wing; the outer margin is typically even and straight, or but slightly convex, but in some specimens the falcation is as distinct as in some of *M. leda*, and in many a trace of it is perceptible. Typically also both wings are unspotted, but in some cases the *forewing* has one or two, or even three, white spots on a blackish ground, and there is a single white spot indistinctly ringed with blackish on the lower median interspace of the hindwing, and sometimes two others, one on either side of the first spot. The **UNDERSIDE** also is much darker; the fasciæ are placed as in *M. leda*, var. (a), but are less distinct and more ferruginous in tone, and the striation is less uniform, being far less distinct on the outer area.

It inhabits much the same range as the variety of *M. leda* referred to; we have specimens from Kulu, Sikkim, Sibsagar, Shillong, Burma, the Wynad and Travancore.

Var. *tristis*, Felder, (PLATE XII, FIG. 27, male). **HABITAT**: North India (Felder); South India. **EXPANSE**: 2.6 to 3.0 inches. **DESCRIPTION**: "MALE: **UPPERSIDE** obscure fuscous, paler

at the margins. **UNDERSIDE:** *Both wings* obscure ferruginous swarthy, densely and ~~fully~~ variegated with white. *Forewing* with five minute ocelli, arranged as in *C. leda* [= *M. leda*]. *Hindwing* with an obsolete ferruginous discal streak, subangulate externally, with six ocelli much smaller than in *C. leda*. The form of the wings differs proportionally from all the examples of *C. leda* from many localities now before us. The *forewing* is longer in the inner margin; the *hindwing* likewise is broader, but shorter within than in *C. leda*" (*Felder, Reise Novara, Lep.*, vol. iii, p. 464, n 785 (1867)).

M. tristis is clearly distinct from *M. leda*, but we are unable to find any character which satisfactorily separates it from *M. arua*, of which it appears to be merely a variety. The paler margins of the upperside, and the extent to which the ferruginous bands of the underside are developed show much variation in different specimens. The figure shows the upper and undersides of a male specimen from the Wynaad, in the Indian Museum, Calcutta.

Var. *suyudana*, Moore. **HABITAT** Java (*Moore*), Ceylon. **EXPANSE** 2.6 to 2.8 inches. **DESCRIPTION** "UPPERSIDE deep dark brown, paler on the margins; a single whitish spot near the apex of the *forewing*, and a minute dot on the *hindwing*. UNDERSIDE deep mottled ferruginous brown, with indistinct darker usually transverse streaks, a triangular space of mottled greyish-white from the costal margin near the apex. *Hindwing* with six small pale spots centred with a white dot." (*Moore, Horsfield and Moore, Cat. Lep. E. I. C.*, vol. 4, p. 224, n 466, 1857.)

We have two specimens from Ceylon which answer very closely to this description. In one of them the upperside is immaculate, but the underside of both agree almost exactly. The outer margin of the *forewing* is very slightly angled. As a species it appears inseparable from *M. arua*, but the subapical triangular pale patch on the underside of the *forewing* is more prominent than in any specimens of *M. arua* we have seen. It is not included in Moore's "Lepidoptera of Ceylon."

245. *Melanitis bela*, Moore.

M. bela, Moore, Horsfield and Moore, *Cat. Lep. E. I. C.*, vol. 4, p. 223, n 465 (1857).

HABITAT: Eastern Himalayas, Assam, Tenasserim, South India.

EXPANSE: 2.9 to 3.3 inches.

DESCRIPTION. "UPPERSIDE deep dusky-brown. *Forewing* with a small indistinct ferruginous streak, below which the space is blackish, the two usual white spots. *Hindwing* with one minute white dot. UNDERSIDE deep mottled ferruginous-brown. triangular patch near the apex of the *forewing* paler. *Hindwing* with six spots" (*Moore, l. c.*) The FEMALE is slightly paler than the male, and the wings broader, but it is identical in markings.

M. bela, as found in North-Eastern India, appears to be less variable than the other species of *Melanitis*; the UPSIDE is very dark brown, the margins irrorated with ashy, most broadly about the apex of the *forewing*, the ferruginous streak from the costa is never very distinct, and often scarcely discernible, the black patch is indistinct; the white spots are almost invariably both present and prominent, the upper one the larger, and there is almost always a single submarginal white dot on the *hindwing* on the lower median interspace, and sometimes another on the upper median interspace. On the UNDERSIDE too it is comparatively constant, sometimes the ferruginous tint, sometimes an ashy grey tint prevails, but usually the basal half is somewhat darker than the rest, and the ground-colour is variegated by dark brown mottlings tending to coalesce in irregular patches, and with greyish mottlings indistinctly grouped into transverse bars on the *forewing*, the ocelli are blurred and often indistinct, and the addition of a few ochreous dots completes the resemblance to a dark and withered leaf. The *forewing* is moderately falcate in all the specimens we have seen.

From South India we have a fairly typical specimen taken by Mr. G. Vidal at Khandalla on the 4th April; and a very curious variety taken by Mr. Rhodes Morgan in the Wynaad in which the ocelli of the underside on the *forewing* are placed on a series of diffused white patches largest on either side of the upper median nervule. It also seems not unlikely from

the descriptions that *M. varaha* and *M. gokala* are merely South Indian varieties of *M. bela*, and from the figures that *M. tambra* is a variety from Ceylon, but on these points we are as yet unable to speak definitely.

M. bela is not uncommon in Sikkim, and at Sibsagar in Upper Assam. Captain C. H. E. Adamson took it at Akyab in October, Captain C. T. Bingham took it in Tenasserim in the Meplay Valley in January and February, and in the upper and lower Thoungyeen forests in March, April and May, and Mr Harold Fergusson has sent a single specimen from Travancore.

246. *Melanitis tambra*, Moore

M. tambra, Moore, Lep. Cey., p. 15, pl. ix, figs. 2, 2b, male, 2a, female, 2c, larva and pupa (1880).

HABITAT: Ceylon.

EXpanse: ♂, 2.5; ♀, 2.75 inches.

DESCRIPTION: "MALE UPPERSIDE dark dusky olive brown. Forewing ferruginous-brown at the apex, with a subapical small white spot (in some specimens an indistinct lower spot), and an indistinct black contiguous spot Hindwing without markings. UNDERSIDE dusky ferruginous or purple ferruginous, nervures speckled with pale ochreous, basal area densely covered with dark purple ferruginous strigæ forming three confluent irregular fasciæ on the forewing, but more uniformly disposed on the hindwing, which has a narrow discal fascia only. Forewing with a pale triangular costal space before the apex, and four small ochreous brown ringed spots, the penultimate spot with a contiguous inner white spot, posterior margin broadly dull sep brown. Hindwing with a pale ochreous space and a contiguous dusky spot within end of the cell, disc transversely washed with greyish-purple, a submarginal row of small ochreous brown ringed spots. FEMALE. UPPERSIDE ferruginous olive-brown. Forewing with a subapical dusky black patch extending paler across end of the cell to costal nerve, and suffusedly bordered externally and across the apex with paler ferruginous, and centred with two white spots, the lowest spot small or obsolete. Hindwing with three or four lower submarginal small white spots. UNDERSIDE ferruginous; strigæ, transverse fasciæ, and outer border dark ferruginous subapical spots on forewing and submarginal spots on hindwing with double rings and whitish centres, the penultimate subapical spot with a contiguous inner larger whitish spot. Body brown. Legs ferruginous."

"LARVA elongated, thickened in the middle, head with two long pubescent red processes; last segment also with two processes, green with longitudinal and transverse darker lines; face striped with red. PUPA green, head and thorax flattened" (Moore, l. c.)

"Found in the western and central provinces of Ceylon. Plains and up to 3,000 feet. June to September. Habits same as *M. leda*." (Hutchison)

The figures given by Moore do not at all answer to his description quoted above. The MALE is shown as having the UPPERSIDE dark brown, the margins irrorated with pale ashy brown, the forewing with the usual two white spots and a well defined oval ochreous patch on the costa, the hindwing unmarked; the FEMALE is dark brown, slightly paler and mottled with blackish on the margin; the forewing with a single indistinct white spot, the middle of the costa suffused with ferruginous and mottled with blackish; the hindwing unmarked. The UNDERSIDE is shown as uniform dark chestnut brown, slightly paler at the margins, and with very indistinct darker strigæ; a single ferruginous brown discal streak on each wing; the forewing with a single pure white spot, the hindwing with four submarginal ochreous spots and two similar spots at the end of the cell, a few whitish scales along the nervules at apex of forewing and abdominal half of hindwing. In the figures of the upperside the outer margin of the forewing is falcated, in that of the underside it is straight and nearly even.

We have seen no specimens and can make nothing satisfactory of this species; from the description it appears to be allied to *M. aswa*, var. *suyudana*, which also occurs in Ceylon; but from the figures it would seem to be merely a variety of *M. bela*.

247. *Melanitis varaha*, Moore.

M. varaha, Moore, Horsfield and Moore, Cat. Lep. E. I. C., vol. i, p. 224, n. 457 (1857).

HABITAT: Canara, South India.

EXPANSE: 2·37 inches.

DESCRIPTION: "UPPERSIDE dusky-brown, ashy-brown along exterior margins; subapical patch indistinctly black, with two white spots. UNDERSIDE ashy, tinged with olive from the base to the middle of wing: near apex of forewing two small brown dots. Hindwing with a submarginal row of indistinct paler spots." (Moore, l. c.)

We are unable to identify this species; nothing that we have in our collections answers exactly to the description; the shape of the forewing is not indicated; the very small size is only approached by some specimens of *M. arwa*; but it seems to us that it is nearest to *M. bela*, of which it may probably prove to be merely a small variety.

248. *Melanitis gokala*, Moore.

M. gokala, Moore, Horsfield and Moore, Cat. Lep. E. I. C., p. 224, n. 468 (1857).

HABITAT: Canara, S. India.

EXPANSE: 3 inches.

DESCRIPTION: "UPPERSIDE brown, suffused with ashy about the apex and exterior margins; an indistinct blackish subapical patch (without spots). UNDERSIDE glossy olive-brown, washed on the basal two-thirds with pulverulent ashy-white; a small white dot on lower disco-cellular nervule, and another near anal angle of hindwing." (Moore, l. c.)

This species also we are unable to identify; the outline of the forewing is not indicated; it seems to be closely allied to *M. bela*, but the complete absence of the white spots of the upperside, and of the submarginal series of the underside of the hindwing would, if constant, suffice to distinguish it. In all the specimens of *M. bela* that we have seen the anterior spot on the upperside of the forewing is invariably present, and in almost all cases both are visible.

249. *Melanitis ismene*, Cramer. (PLATE XII, FIG. 28 ♂)

Papilio ismene, Cramer, Pap. Ex., vol. i, pl. xxvi, figs A, B (1775); *P. mycenæ*, idem, id., vol. iv, pl. cxcii, fig. F; *P. arceutis*, idem, id., pl. cxcii, fig. C (1780); *Melanitis ismene*, Moore, Lep. Cey., vol. i, p. 24, pl. x, figs 2, 2a, male; 2b, larva and pupa (1880); idem, id., Distant, Rhop. Malay., p. 42, n. 2, pl. iv, figs 9, 10, male; 11, female (1882).

HABITAT: Throughout India, Ceylon, Burma, Andaman Isles, and the Malay Peninsula and Archipelago.

EXPANSE: 2·8 to 3·2 inches.

DESCRIPTION: MALE and FEMALE: UPPERSIDE uniform rather dark brown. Forewing with a large black spot pupilled with white, placed between the second and third median nervules, with another somewhat elongated black spot in the interspace above it also with a white spot, but placed upon or near to its exterior margin; sometimes with a third indistinct suffused spot below the second median nervule. These spots are inwardly and beneath, below the second median nervule, bordered with bright ferruginous; there is also a somewhat square patch of this colour above the uppermost black spot. In some specimens there is a suffused black patch merging into the dark ground-colour on either side of the subapical squarish ferruginous patch. Hindwing usually with one or two submarginal black spots with white centres near the anal angle; these vary much in size, as also in number, and in some specimens are entirely wanting. The costa near the apex of the forewing, and the outer margin of both wings is in some specimens paler, thickly sprinkled with darker atoms, showing in this respect an approach to *M. duryodana*. UNDERSIDE extremely variable. The ground-colour in some specimens is very pale buff-brown, in others ferruginous, in some gray, and again in others almost black, with innumerable shades between all these colours. In most specimens there is a dark discal band common to both wings, with another similar band, but straighter, across the forewing about midway between the first band and the apex. Many

specimens are covered with irregular black or dark brown spots and blotches resembling fungi on dead leaves; some specimens have one or two white spots on the forewing, and a submarginal series of six more or less perfect ocelli on the hindwing, these latter being more usually represented merely by whitish spots, and are always more or less blurred. In all the specimens we have seen the forewing is more or less falcate (sometimes almost truncate) at apex, and caudate in the hindwing. The FEMALE is somewhat paler, and the ferruginous markings are rather more diffused.

"LARVA elongated, thickened in the middle, pubescent; head large, surmounted by two short pubescent red processes, last segment also with two processes, pale green with longitudinal rows of whitish dots, dorsal and lateral line darker green; head bluish, face striped with green and black. Feeds on Gramineæ. PUPA green, cylindrical; head and thorax obliquely flattened" (Moore, l. c.)

M. ismene appears to be everywhere the commonest species of the genus. The upperside is very fairly constant in colouration throughout its range, some specimens, however, having the ground-colour darker than others; but the underside varies strangely even in the same locality; in fact no two specimens can be found exactly alike, and in their markings and tints they harmonise so completely with the autumnal colouration of decaying vegetation that when settled amongst dead leaves and dried up grass it is almost impossible to see them. Its range scarcely extends into the North-West Himalayas. Mr. C. J. Rodgers took it below Dalhousie. In four years collecting in the neighbourhood of Simla Mr. de Nicéville only took two specimens at a low elevation in November. The Indian Museum has a single specimen from Mussoorie, and to the eastward it becomes increasingly commoner. Similarly in the plains it is comparatively rare in the Punjab, in the North-Western Provinces it is much commoner, but throughout Bengal and Central and Peninsular India it is very common, and we have specimens from Assam, Sylhet, Cachar, Burma, Ceylon, and the Andaman Isles.

The figure on PLATE XII shows the upper and undersides of a male specimen from Calcutta in Major Marshall's collection. An outline figure of this species is given on PLATE I.

250. *Melanitis duryodana*, Felder.

Cylo duryodana, Felder, Reise Nov., Lep., vol. iii, p. 464, n. 786 (1867)

HABITAT. Sikkim, Cachar, Upper Assam, Khasi hills, Orissa, Burma and Upper Tenasserim.

EXPANSE: 2.9 to 3.1 inches

DESCRIPTION. "MALE. UPPERSIDE swarthy, obscurely variegated with swarthy and hoary near the external margin (especially on the hindwing). Forewing with the subcostal area increasingly deep fuscous, with an oblique yellow bar-shaped fasciole scarcely reaching beyond the lower discoidal nervule to the hindward, and spreading over the apical third at the costa near the cell; immediately below that two wide black spots, defined externally with fulvous powdering, the upper rather large, the lower much larger, minutely pupilled with ochraceous. Hindwing with three hinder ochraceous dots, obscurely circled with fuscous. UNDERSIDE densely variegated with ferruginous-brown, with ochraceous external dots. Forewing with three costal fascioles, and the terminal area of the costa variegated with ochraceous. Hindwing with a subangulate ferruginous discal streak, the costal border and a streak before the margin ochraceous, variegated. FEMALE: UPPERSIDE paler than in the male. Forewing with the yellow fasciole much broader, paler. UNDERSIDE much paler, obsolete variegated. Hindwing with a blackish discal spot near the streak. Larger than *C. banksia*, [Fabricius, as African form of *M. ismene*]; all the wings longer, and more strongly angulated." (Felder, l. c.)

The Indian Museum, Calcutta, contains three males from Sibsagar, two from Khurda in Orissa, and one from Kulu. They are easily distinguished from the other species in the genus by their rich deep ferruginous brown uppersides, and in having a distinctly lighter outer border to both wings, thickly powdered (especially in the hindwing) with darker atoms. The straight, sharply inwardly defined ferruginous bar extending from the upper black spot almost

to the costa of the forewing, is also a marked feature in this species. There is also a single male from Shillong in Major Marshall's collection. The females are less easy to distinguish; they are as pale as *M. ismene*, but of a brighter brown, the forewing much more falcate; the ferruginous mark extends round the black patch and beyond it to the outer margin, which is broadly suffused with ferruginous, but the distinctive feature is that this ferruginous mark extends to, and is continued along the costa, which it never does in *M. ismene*. The UNDERSIDE of the male greatly resembles that of *M. bela*, to which it is closely allied; that of the female is chiefly remarkable for the bright ochreous tint which prevails, and in both sexes the colouration is comparatively constant. We have specimens of the female from Sikkim, from Shillong taken in November, from Pegu, and from Tenasserim taken in May and October.

251. *Melanitis sitenius*, Herbst. (PLATE XII, FIG. 29 ♀).

Papilio sitenius, Herbst, *Naturs. Schmett.*, vol. viii, p. 5, pl. clxxxii, figs. 1, 2 (1796); *Melanitis vamaus*, Moore, Horsfield and Moore, *Cat. Lep. F. I. C.*, vol. i, p. 223, n. 463 (1857).

HABITAT: Eastern Himalayas, Godavari District, Orissa, Burma, Andaman Isles.

EXPANSE: 3.1 to 3.8 inches.

DESCRIPTION: "Differs from *Melanitis banksia* [an African form of *M. ismene*] in being larger, the subapical ferruginous patch on the forewing occupying a larger space; the deep black patch extends to the costal nervure; the upper white spots smaller, the lower being very indistinct; two white dots on the hindwing. UNDERSIDE marked as in some specimens of *M. banksia*." (Moore, l. c.)

This is the largest species of the genus, excluding *M. constantia*, which has been generically separated under the name of *Hipo*, and is conspicuous from its ochreous tone of colouration, and the large extent of the ferruginous markings near the apex of the forewing. The white spots on the upperside of the forewing are very variable in size, and are sometimes entirely obsolete. The MALE is rather darker than *M. ismene*, specimens from South India and the Andamans being especially dark, and in these latter the ferruginous band is smaller and better defined than in North Indian specimens, and without the white spots. In one specimen the outer margin of the forewing is almost entire; in another the falcation is no more prominent than in typical specimens of *M. leda*. The band usually is interrupted by two black marks, partially or entirely coalesced into a quadrate patch, and above this the band is broadly defined at both edges by diffused black patches, the inner of which coalesces with the quadrate patch on the band; the margins are scarcely paler, and only slightly irrorated with ashy. On the UNDERSIDE it is somewhat variable, but not nearly so much so as *M. ismene*. The prevailing colour is generally grey, more or less variegated with ochreous or fulvous, and irregularly mottled throughout with dark brown dots, here and there clustered into patches; the submarginal spots and the fasciæ usually very indistinct, though sometimes prominent. The FEMALE is larger and paler, with the forewing highly falcate; the outer margins more broadly irrorated with grey and mottled with dusky; the ferruginous band wider and extended narrowly along the costa; it approaches very closely to the female of *M. duryodana*, but it is larger; the white spots of the forewing are indistinct or altogether wanting, and the ferruginous bar above the black patch extends much more obliquely to the costa. The UNDERSIDE is as in the male, but paler and generally much more ochreous or fulvous in tone, and the dark mottlings much less profuse.

M. sitenius is found in the Eastern Himalayas, and the Khasi hills, and through Burma to Tenasserim. We also have specimens from the Upper Godavery taken by Mr. C. B. Morris in September, and from Khurda in Orissa, taken by Mr. W. C. Taylor. In Tenasserim it was taken by Captain C. T. Bingham in the Thoungyeen forests in April; in the South Andamans taken by Mr. F. A. de Roepstorff in August; and there are specimens from the Daffla hills and from Sikkim and Yunnan in the Indian Museum, Calcutta.

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

252. *Melanitis gnophodes*, Butler.

M. gnophodes, Butler, Cat. Lep. B. M., *Satyridæ*, p. 5, pl. ii, fig. 2 (1868).

HABITAT: India.

EXPANSE: 3·2 to 3·3 inches.

DESCRIPTION: "MALE and FEMALE: UPPERSIDE coloured as in *Gnophodes (parmeno)*. UNDERSIDE variegated, the colours as in *phedima* or *banksia*. The male of this species resembles *Gnophodes parmeno** on the upperside; the female has a brighter orange band, and resembles the Natal form of the same insect." (Butler, l. c.)

Judging from Butler's figure of *M. gnophodes* the distinctive feature appears to be a fulvous almost straight band across the forewing beyond the cell from the costa to the hinder angle, bordered internally throughout its length, and externally near the costa, with dusky; the hindwing has two or three submarginal white spots near the anal angle. The forewing is considerably falcated, the outline of the wings being similar to that of *M. zitenius*, but it seems to differ from that species not only by the absence of the two large black patches on the forewing, which is an inconstant character, but also by the shape of the fulvous band, which is narrower, more regular, and more produced toward the hinder angle than in *M. zitenius*; in *M. gnophodes* the outer edge of the band is directed from the costa to the tip of the third median-nervule, while in *M. zitenius* it is directed towards the tip of the falcation above the third median nervule. In Mr. de Méville's collection are four females of *Melanitis zitenius* from Sikkim which agree fairly well with Butler's figure of *M. gnophodes*, in that the two black spots on the forewing are obsolete in two specimens, very obscure in the other two. The ground-colour of the upperside is also paler than in most examples of *M. zitenius*, but these specimens are clearly only varieties of that species, and they suggest a doubt as to whether *M. gnophodes* is really distinct. At all events we have no specimens precisely agreeing with Butler's figure, and in the absence of specimens it must for the present be retained as distinct.

Genus 23.—HIPIO, Hubner.

Hipio, Hubner, Verz. bek. Schmett., p. 56 (1816).

The next species has been retained by Butler under the subgeneric name *Hipio* of Hubner, and on his authority we adhere to the name, but we are unable to indicate any structural features to distinguish it from *Melanitis*. The subgenus contains several species from the Malayan Archipelago, but only a single one is recorded from India, and that appears to be excessively rare; we have never seen a specimen, and have doubts as to whether it really occurs in India at all. Its principal feature is the yellow transverse band of the forewing; the nearest approach to which is in *M. gnophodes*; and its large size which considerably exceeds that of any of the Indian *Melanitis*. It has large distinct ocelli on the underside of the hindwing as in *M. leda*.

253. *Hipio constantia*, Cramer.

Papilio constantia, Cramer, Pap. F. x., vol. ii, pl. cxxxiii, figs. A, B (1777); *Satyrius constantia*, Godart, Enc. Méth., vol. ix, p. 477, n. 1 (1819); *Cylio constantia*, Hewitson, Journ. Linn. Soc. Lond., Zoology, vol. viii, p. 243 (1864).

HABITAT: Darjiling and K. India (Moore); Malaya.

EXPANSE: 4·1 inches.

DESCRIPTION: FEMALE: UPPERSIDE deep rich brown. Forewing crossed beyond the cell from the costa to the inner angle by a broad band of ochreous, darker at the edges, and bearing in the interspace above the third median nervule a triangular white spot, bordered with black; below which is a black ocellus, pupilled with white and with a rufous l.s. The outer dark area bears a single small round black spot above the lower discoidal nervule. Hindwing with a black submarginal line and three black spots near the anal angle, the two

* A south and west African species.

outer ones pupilled with white. **UNDERSIDE** paler brown, thickly striated throughout with deeper brown. *Both wings* with a common dark brown subbasal fascia commencing at the subcostal nervure of the forewing, and ending at the median nervure of the hindwing; also with another wider and more prominent deep brown fascia commencing at the costa of the forewing, cutting the cell just beyond its middle, and crossing the hindwing beyond the cell in an inwardly curved line, and ending at the abdominal margin. This fascia is faintly bordered with pale brown outwardly on the forewing, more broadly and with a paler shade of the same colour on the hindwing. The outer margin of both wings of a deeper brown than the ground-colour, this border terminating on the hindwing at the tail, from thence to the anal angle the margin is but little deeper than the ground. *Forewing* crossed by a straight, transverse, outwardly sharply defined deep brown fascia, commencing at the costa, crossing the wing just beyond the cell, and not reaching the inner angle. This fascia is outwardly bordered with a band of pale brown. A submarginal series of three spots, the lowest in the interspace above the third median nervule somewhat large and white; the one above it black, pupilled with white and with a yellow iris; the third in the next interspace very small and white. *Hindwing* with a submarginal series of seven oval black ocelli, pupilled with white, and with yellow irides; the first the largest, the fourth and fifth also large and nearly equal in size, the sixth and seventh geminated. (Described from Cramer's plate).

"**MALE**: **UPPERSIDE** differs from the female only in having the transverse band more rufous and nearer the apex, the **UNDERSIDE** darker, with the ocelli of the *hindwing* much larger and more distinct." (*Hewitson*, l. c.)

The next species was originally described as a *Melanitis*, but was subsequently separated by Mr. Butler on the grounds stated below. The differences appear to be sufficiently marked to warrant generic separation.

Genus 29.—CYLLOGENES, Butler. (PLATE XIII).

Cyllogenes, Butler, Cat. Lep. B. M., *Satyrina*, p. 6 (1868).

"Differs from *Melanitis* in the violet colouring of the **UPPERSIDE**; the concave form of the disco-cellulars of the *forewing*; the more wedge-shaped cell of the *hindwing*; and in the presence of a large silky dark patch in the forewing of the male." (*Butler*, l. c.)

Only a single species is known, which inhabits Sikkim; it has a short, curved, yellow band near the apex of the forewing in both sexes.

254. *Cyllogenes suradeva*, Moore. (PLATE XIII, FIG. 30 ♂ ♀).

Melanitis suradeva, Moore, Horsfield and Moore, Cat. Lep. E. I. C., vol. 1, p. 225, n. 469 (1857).

HABITAT: Sikkim.

EXPANSE: 3 inches.

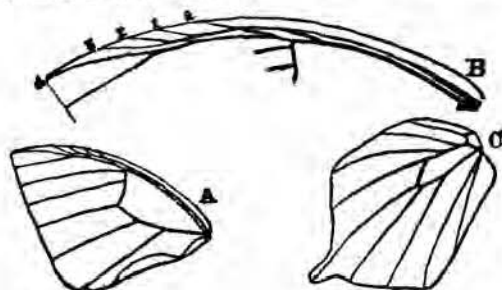
DESCRIPTION: "**MALE**: **UPPERSIDE** deep vinaceous-brown, darkest at the apex, and having in some lights a purple gloss. *Forewing* with a large black patch in the middle; a short narrow obliquely-curved yellow subapical streak. **UNDERSIDE** dull ochreous, suffused with brown, and covered with short, narrow, undulating stræ, as in *Melanitis leda*; a transverse darker streak across the middle of *both wings*; four small whitish submarginal spots on the *forewings*, and two near the anal angle." (*Moore*, l. c.) In the specimen in the Indian Museum, Calcutta, the male has also on the **UNDERSIDE** a purplish-white cloudy discal band on *both wings* beyond the darker streak. The **FEMALE** differs from the male in having the wings much broader, the yellow band broader, reaching the costa and extending partially along it, and it lacks the dark silky patch on the *forewing*; on the **UNDERSIDE** it is paler, and lacks the transverse purplish-white band.

C. suradeva appears to be a very rare insect. Colonel A. M. Lang, R. E., has five males in his collection, all from Sikkim, and Mr. Otto Moller has taken a female specimen also in Sikkim. The figure is taken from a male and a female from Sikkim in the Indian Museum, Calcutta, and shows the uppersides only.

The last genus of the *Satyrinae* included by us in the Indian fauna contains but one species, and is perhaps one of the most remarkable in the subfamily. Mr. Wood-Mason notes: "No Asiatic genus of *Satyrinae* presents us with any approach to the remarkable arrangement of the two hindmost veins of the forewing; but, in the South American genus *Antirrhæa*, we meet with identically the same arrangement, the first median nervule in *A. archæa* and its congeners running back to the inner angle, and the submedian nervule ending a considerable distance short of that angle, though not nearly so far short of it as in the Indian form. I propose the name *Parantirrhæa* in allusion to these remarkable points of resemblance. The species of the subfamily *Elymninae* alone present the same disposition of the three anterior nervules of the hindwing."

Genus 30.—PARANTIRRHÆA, W.-M.

Parantirrhæa, Wood-Mason, Journ. A. S. B., vol. xlix, pt. ii, p. 248 (1880); *Parantirrhæa*, id., Ann. and Mag. of Nat. Hist., fifth series, vol. vii, p. 333 (1881).



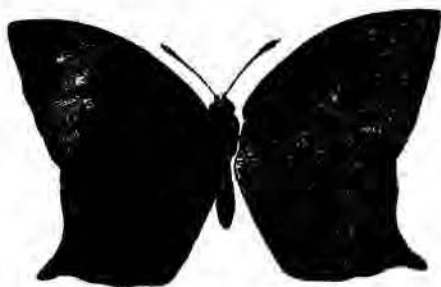
A. Right forewing from the under-side, natural size, to show the whole venation, and the inflected lobe of the inner margin. B. Anterior portion of the same, much enlarged, to show the relations of the nervules to one another. C. Right hindwing, from the underside, natural size.

"MALE: FOREWING triangular; costal margin moderately and regularly arched; apex acute; outer margin almost straight, being only just perceptibly convex; inner angle rounded; inner margin sinuous, being lobed at the base much as in the males of *Clerome* and *Aemona*, genera of *Morphinae*; subcostal nervure four-branched, the first branch given off before, and the second beyond, the end of the discoidal cell, the first, second, and third coalescing successively and respectively with the costal nervure; the first, and the second, and all three in turn becoming free and running off at a tangent, like the costal nervure, to the anterior margin, the fourth being perfectly free from its origin and running to the apical angle; lower disco-cellular nervule long, very slightly concave outwards, almost straight; middle one not quite half the length of the lower one, upper one rudimentary; submedian nervure sinuous, short, terminating near the inner margin at about the level of the junction of the basal and second fourth of the length of that margin, being, in fact, hardly more developed than is the internal nervure of the *Papilioninae* as compared with that of many Heterocerous Lepidoptera; the first median nervule directed straight outwards and backwards, out of its normal course, to the inner angle, and supplying the place of the rudimentary submedian nervure. On turning to the underside, it is seen that a narrow rounded lobe of the functional sutural area [inner margin] about six times as long as it is broad, is folded back upon the under surface, to which it is firmly adherent. This lobe occupies the middle two-fourths of the length of the inner margin, and is thickly clothed on its surface and fringed at its free edge with firmly attached, long, and somewhat raised modified scales, rendered conspicuous by their rich dark brown colour and satiny lustre. The outline of this turned-up lobe is marked out on the upperside by a curvilinear groove. HINDWING tailed, subquadrate, with four distinct margins, viz., a strongly and irregularly arched costal margin, nearly straight external and hind margins, and an inner

or abdominal margin, marked out by the obtuse-angled apex, the tail, and the well-rounded anal angle; with a black, oval, sexual mark, divided by the submedian nervure, near the anal angle; *costal* nervure short and straight, terminating before, and the first branch of the subcostal which originates close to the base of its nervure ending beyond, the middle of the length of the costal margin, the second branch being given off before the middle of the discoidal cell, and extending into the apical angle; the *discoidal nervule* in the same straight or slightly curved line with the subcostal; the *disco-cellular* nervule sinuous; the *third median nervule* produced to a conspicuous tail. *Antennæ* fine and distinctly clubbed. *FEMALE* unknown." (*Wood-Mason*, l. c., in Journ. A. S. B.)

255. *Parantirrhoea marshalli*, W.-M.

P. marshalli, Wood-Mason, Journ. A. S. B., vol. xlix, pt. ii, p. 250 (1880); idem, id., Ann. and Mag. of Nat. Hist., fifth series, vol. vii, p. 335 (1881).



HABITAT: Trevandrum, Travancore.

EXPANSE: 2·4 inches.

DESCRIPTION: "MALE: *UPPERSIDE*, both wings dark fuscous, suffused with rich deep violet. *Forewing* with an outwardly and forwardly arched, subrescenscent, pale violet or mauve band, commencing beyond the middle of the wing at the costal nervure, terminating at the inner angle, and crossed obliquely by a series of three small white spots disposed in a straight line parallel to the outer margin, and placed upon folds of as many consecutive interspaces, the last being between the second and third median nervules. *Hindwing* relatively longer tailed than in *Melanitis ismene*, Cramer, with the membranous parts of the divergent tail almost wholly formed by the produced wing-membrane of the interspace between the second and third median nervules, a very narrow anterior membranous edging only being contributed by the interspace next in front; and with rather more than the basal two-thirds of its length in front of the discoidal nervule and subcostal nervure ochreous. *UNDERSIDE*, both wings ochreous, obscurely striated with a deeper shade of the same colour, and marked with a submarginal series of inconspicuous brown specks, the probable rudiments of ocelli. The *FEMALE* will, in all probability, prove to differ from the male not only in the absence of the sexual spot in the hindwing, but also in having the inner margin of the forewing straight, and neither lobed at the base nor turned up in the middle, and the first median nervule and the submedian nervure normally arranged and developed, and directed respectively to the outer margin and to the inner angle after the manner usual among butterflies." (*Wood-Mason*, l. c., in Journ. A. S. B.)

P. marshalli has as yet only been found in Travancore, where it was discovered by Mr. H. S. Fergusson on the Ashambo Hills in May.

The figure shows the upper and undersides of a male specimen from Trevandrum, South India, in the Indian Museum, Calcutta.

SUBFAMILY III.—ELYMNIINÆ, Herrich-Schäffer, (PLATE XVII).

Elymniina, Herrich-Schäffer, Prodr. Syst. Lep., pt. i, p. 15 (1864); *Eurytelida*, in part, Westwood, Gen. D. L., vol. ii, p. 403 (1851).

BODY moderately robust. HEAD moderate-sized. Eyes naked, prominent. *Antennæ* slender, with a slender gradually-formed indistinct club. *Palpi* elongate, porrect, clothed beneath with short appressed hairy scales and perceptibly tufted above, the tuft lying against the face and following the contour of the eye. WINGS large, weak, generally dentate, and very seldom ocellated. FOREWING with the *costal nervure* always greatly swollen at the base. *Discoidal cell* short and very broad; *upper disco-cellular nervule* very short, just beyond the second subcostal nervule; the upper discoidal nervule originating close to the subcostal nervule; the *middle disco-cellular* much longer, inwardly oblique, the *lower disco-cellular* considerably the longest, highly concave, and closing the cell by junction with the median nervule at the origin of its second branch. *Submedian* nervule undulate, extending to the hinder angle. HINDWING, *male* with a glandular patch in the upper half of the cell, overlaid by two tufts of erectile hairs laid along the atrophied trunk of the discoidal nervule in the middle of the cell; *discoidal cell* short, broad; *upper disco-cellular* originating generally at some distance beyond the first subcostal nervule, moderately long; *lower disco-cellular* considerably longer and uniting with the median nervule at the origin of the second median nervule; *costal nervure* divided at the base, forming a false prediscoidal cell; abdominal margin slightly channelled to receive the abdomen. FORELEGS small, those of the MALE more or less hairy, cylindrical, blunt at tip; those of the FEMALE also small, cylindrical, and blunt at the tip, but longer and not perceptibly hairy.

"LARVA cylindrical, rather attenuated before and behind. Head armed with two erect spines; abdomen terminated by two more elongated divergent spines. PUPA suspended by the tail, with small tubercles along the back and sides; the middle of the dorsum of the thorax-case elevated into an obtuse point; head terminated by two conical points." (Westwood, l. c., p. 404.)

The *Elymniina* constitute a small group of Old World butterflies ranging from West Africa to New Guinea, the head quarters of which are in the Malayan Archipelago. Westwood, in the Genera of Diurnal Lepidoptera, grouped them with *Eurytela*, *Ergolis*, *Byblia* (= *Hypanis*) (*Nymphalina*), and a few American genera, in a separate family under the name of *Eurytelida*, at the same time remarking that he should prefer to rank it as a subfamily only. Mr. Kirby, in his Synonymic Catalogue of the Diurnal Lepidoptera (1871), places it alone as a separate subfamily between the *Satyrina* and the *Morphina*. Mr. Distant, in his Rhopalocera Malayana (1882), includes it in the *Satyrina* with the following remark: "I have included this genus in the *Satyrina*, in which subfamily it possesses a somewhat unique position, not only in general colouration and markings, but also by its neururation, the second and third median nervules of the forewing having a common origin;" and he adds that Mr. Kirby has also recently included it among the *Satyrina*. In habits and weakness of flight the *Elymniina* closely resemble the *Satyrina*. In the sexual patch and tuft of the hindwing of the male they shew an affinity to some *Morphina*, and also to *Mycalesis*. In the dilation of the base of the costal nervure they also show affinity with the *Satyrina*, with at least one genus of the *Morphina*—(*Clerome*), and with the genera *Eurytela*,

Ergolis and *Byblia* of the *Nymphalinae*. In the clothing of the palpi they resemble *Melanitis*, which in this respect is an aberrant genus of *Satyrinae*, but the short wide cell in both wings closed at the origin of the second median nervule, the brilliant colouring which among the *Satyrinae* is only approached in *Calites*, the almost universal absence of ocellation, the frequency of an irregular dentate outline of the wings, and above all the highly mimetic character of the species, make it a group by itself, and justify its retention as a separate subfamily; it appears to have little in common with the *Morphinae* except in its habits, and perhaps in the brilliant colours of the upperside.

The subfamily consisted, till comparatively recently, of a single genus—*Elymnias*. In 1869 Mr. A. R. Wallace, in a paper on Eastern Butterflies (Trans. Ent. Soc. Lond., 1869, p. 321) wrote: "It is interesting to observe that the species from the Austro-Malayan islands form a compact group, distinguished by a regular and somewhat rounded outline of wings, resembling in colouration some of the broad winged *Euplaas*, or the genus *Drusilla* [a peculiar genus of *Morphinae* which now stands under the name *Tanaris*, confined to the Malayan archipelago]; while the species of India and the Indo-Malayan islands are almost always characterised by a more irregular outline, waved, dentate, or even caudate, and generally coloured like species of *Danaus*, or the more elongate forms of *Euplaea*." Following on this in 1871, Mr. C. Butler (Proc. Zool. Soc. Lond., 1871, p. 518) in a monograph of the subfamily divided it into two genera, *Elymnias* and *Dyctis*, basing the division mainly on the character of the neurulation of the hindwing, and omitting the features of outline indicated by Mr. Wallace, for though the genus *Dyctis* as defined, embraces all the Austro-Malayan species, it also includes several of the Indian and Indo-Malayan species; some of the latter being indistinguishable, so far as outline is concerned, from species which are retained as true *Elymnias*. In a highly mimetic subfamily such as this, outline is a feature on which little reliance can be placed as a generic character, and style of colouration is of little use even for the determination of minor groups within a genus; even the style of neurulation is not always a safe guide, but as there is a well-marked difference in the shape of the disco-cellular nervules of the hindwing to separate *Dyctis* from *Elymnias*, we retain them as distinct.

The *Elymninae* are forest-loving insects, with a weak flight, frequenting dense undergrowth or bush jungle, and usually avoiding the open sunshine; they are all tropical or sub-tropical insects, and within our limits are only found in the region of heavy rainfall, in Ceylon the hills of South India and along the East Coast to Bengal; thence they stretch westwards along the warm valleys of the outer Himalayas as far east as Mussoorie, and eastwards through Assam, Sylhet and Burma into the Malay peninsula.

Genus 31.—ELYMNIA, Hubner. (PLATE XVII.)

Elymnias, Hübner, Verz. bek. Schmett., p. 37 (1816); *Melanitis* (part), Fabricius, Ill. Mag., vol. vi, p. 28a (1807); id., Westwood, Gen. D. L., vol. ii, p. 403 (1851); *Byblia* (part), Latreille, Enc. Méth., vol. ix, p. 10 (1819); *Elymnias* (restricted), Butler, Proc. Zool. Soc. Lond., 1871, p. 519.

CHARACTERS of the subfamily, but with the lower disco-cellular nervule of the hindwing highly concave from the origin of the discoidal nervule.

The butterflies of this genus vary much in outline, but with the single exception of *E. penanga* all the Indian species have the outer margin of the forewing perceptibly dentate, the hindwing is dentate in all, and in many of them strongly caudate. *E. penanga* has three black ocellular dots on the underside of the hindwing; *E. obnubila* has a complete submarginal series of small ocellular spots, and *E. mimus* has them largely developed; in *E. undularis* and some of its allies the only trace of the series is a silvery subcostal spot; the magnified pupil of an obsolete ocellus, and sometimes as many as four smaller spots, one in each interspace, from the anal angle, but in no other Indian species of the restricted genus is there any trace of ocellation whatever. Of the species which have blue markings on the upperside, *E. undularis* and its allies are distinguished by having the outer margin of the hindwing ferruginous or fulvous, the blue markings being confined to a submarginal series of spots on the forewing; *E. penanga* has a large blue patch on both wings, with paler blue streaks in it on

the forewing only. *E. saueri* and *E. leucocyma* both have the large blue patch, with pale blue spots on it on the forewing only, but the outline of the wings differs, and the underside is quite distinct, being in *E. saueri* beautifully marbled throughout with shades of brown and yellow and a little grey, while in *E. leucocyma* it is an uniform shade of brown, with numerous yellowish or ochreous transverse strizæ.

Key to the Indian species of Elymnias.

A. Hindwing with the lower discal cellular nervule highly concave

a. Males with a patch of loosely attached scales* at the base of the interspace between the median and submedian nervules on the upperside of the forewing. Hindwing with the upper discal cellular nervule suberect or inwardly oblique. The outer margin dentate or slightly caudate.

a¹ Male blackish brown, with a submarginal series of blue spots on the upperside of the forewing, outer margin of hindwing broadly ferruginous. Female marked somewhat as in *Danaus chrysippus* or *D. alippus*.

256. *E. UNDULARIS*, North and East India, Burma

257. *E. TINCTORIA*, Tenasserim

a² Male with the blue spots on the upperside of the forewing obsolete; the outer margin of hindwing fulvous. Female similar to *E. undularis*.

258. *E. PRATERNA*, Ceylon.

a³ Male and female dark brown, with a submarginal band of dull ferruginous on the upperside of both wings. No blue spots on the forewing.

259. *E. CORTONIS*, South Andamans

b. Males with no patch of loosely attached scales* at the base of the interspace between the median and submedian nervules on the upperside of the forewing

a¹ Hindwing with the upper discal cellular nervule suberect

a² Hindwing almost entire, not caudate. Male upperside purplish brown, with a large blue patch on both wings. Female bluish brown, with a large whitish patch on the forewing

260. *E. PUNABGA*, Tenasserim, Malay Peninsula

b² Hindwing distinctly caudate

a³ Male, upperside blackish brown, forewing with a series of white spots. Female marked like *Danaus genutia*.

261. *E. C. DATA*, South India

b³ Male and female upperside brown, with a pale brown submarginal band to both wings. Underside, hindwing with prominent ocelli

262. *E. MIMUS*, Nicobars,

c¹ Male and female, upperside fuscous, with a pale ferruginous band to both wings. Underside, hindwing with the ocelli small

263. *E. ORNIVOLA*, Tenasserim

Hindwing with the upper discal cellular nervule obliquely directed outward

a² Outer margin very slightly dentate, almost entire, hindwing not caudate. Male and female, upperside coloured and marked almost as in *Euphaes midamus*. Underside marked with pale ochreous strizæ more prominent in the female

264. *E. LEUCOCYMA*, North East India, Burma

b² Outer margin dentate, hindwing slightly caudate. Upperside dark chestnut-brown, forewing shot with violet, with a violet patch on the disc, and pale violet discal spots. Underside thickly marbled with dark chocolate-brown strizæ. Female unknown.

265. *E. SAUERII*, Tenasserim

c² Outer margin more dentate. Forewing somewhat falcate, hindwing distinctly caudate. Upperside marked with pale greenish or yellowish or bluish streaks between the nervules

266. *E. TIMANDRA*, North East India, Burma.

* These scales are precisely similar in form and structure to those of the rest of the wing, but they are slightly larger and less densely packed, allowing the wing membrane to show in tiny points and giving a slight sheen to the patch in certain lights. They come off easily with a slight rub leaving the patch bare.

E. timandra is quite distinct from every other Indian *Elymnias*, so far as its markings are concerned, but in outline of the wings it is identical with *D. peali* (see next genus *Dytis*). Of those species without blue markings on the upperside, *E. caudata* may be distinguished by its submarginal series of white spots on the forewing, and *E. cottonis* by its less dentate and caudate outline, and the complete absence of markings on the upperside and of ocelli on the underside. Males of *E. undularis*, *E. fraterna* and *E. cottonis* have a patch of scales on the upperside of the forewing at the base of the interspace between the median and submedian nervures, which are loosely attached to the wing membrane, and easily removed by a camel's hair paint brush. Mr. Butler pointed out this feature (Proc. Zool. Soc. Lond., 1871, p. 519), calling it a "patch of thickened scales," but did not state in what species it occurred: it is not a very conspicuous feature, nor is its morphological value clear, but so far as we know it is confined to *E. undularis* and its allies, being much more marked in the typical species than in the others.

The habits of the species of *Elymnias* are as in the subfamily.

256. *Elymnias undularis*, Drury. (PLATE XVII, FIG. 59 ♂ ♀).

Papilio undularis, Drury, Ill. Ex. Ent. vol. ii, pl. x, figs. 1, 2 (1773), male; id., Cramer, Pap. Ex., vol. iii, pl. cclvi, figs. A, B (1779), male; *Biblis undularis*, Godart, Enc. Méth., vol. ix, p. 325, n. 2 (1819); *Melanitis undularis*, Horsfield, Cat. Lep. E. I. C., pl. viii, figs. 8, larva; 8a, pupa; 8b-8h, structure of imago (1829); *Elymnias undularis*, Wallace, Trans. Ent. Soc. Lond., 1863, p. 372, n. 1; *E. jama.* Hübner, Ex-Schmett., figs. 37, 38 (1818), male; *Papilio proteogenia*, Cramer, Pap. Ex., vol. ii, pl. clxxxix, figs. F, G (1777), female; *Biblis proteogenia*, Godart, Enc. Méth., vol. ix, p. 327, n. 5 (1819).

HABITAT. North-Eastern and Central India, Burma, Java.

EXPANSE: 2'3 to 3'4 inches.

DESCRIPTION: MALE. UPPERSIDE dark velvety blackish brown. Forewing with bluish irrorated striae along the costal margin, and a curved submarginal series of bluish irrorated spots one on each interspace, elongate near the apex, rounded below the lower discoidal nervule. Hindwing with the outer margin broadly suffused with dark ferruginous. Cilia short, whitish. UNDERSIDE brown, slightly paler on the outer half, especially on the hindwing, and covered with coarse confluent chestnut-brown undulations; some greyish-white irrorations on the outer half of the costa of the forewing; and others forming an indistinct and incomplete submarginal nebulous band on the hindwing. A prominent whitish subcostal spot on the hindwing.

This species is subject to considerable variation; the typical form described above occurs most frequently in North-East Bengal and Burma, but neither this nor any of the variations from it in the male insect which occur in India, appear to be peculiar to any locality or range. On the upperside the violet blue spots of the forewing vary in intensity, in some specimens those near the apex are coalesced into a subapical band, while in others the spots are all separate and distinct; on the hindwing the outer border varies from dull dark ferruginous to bright pale ferruginous, sometimes quite unmarked, rarely divided by dark nervules, sometimes with a paler spot on each interspace; these spots are in some specimens very pale ferruginous, in others they are irrorated with pure white, and in some the spot nearest the costa is blue, like those on the forewing. On the UNDERSIDE the most frequent variation is in the whitish irrorations of the costa of the forewing being coalesced into a prominent sharply-defined triangular patch with its apex near the lower discoidal nervule; and the outer half of the wings is often also distinctly paler, tinged with grey and sparingly marked with fine chestnut undulations; rarely there is a submarginal series of whitish spots on the hindwing.

THE FEMALE is coloured something after the style of *Danaë chrysippus*; on the UPPERSIDE the forewing is blackish-brown, with a large tawny patch on the lower half, occupying the lower half of the cell, the interno-median interspace almost to the margin, the lower median interspace to not quite so far, and the basal area of the two next interspaces above it; some white transverse striae on the costa, a broad subapical white transverse band, followed by three decreasing white spots one below each median nervule. The hindwing is tawny, broadly bordered with blackish-brown, on which are three or four large round white submarginal spots. UNDERSIDE

coloured as on the upperside, but paler and more suffused, the white markings represented by a nebulous band on both wings expanding at the apex of the forewing more or less distinctly into a triangular patch as in the male; the whole area of both wings being coarsely undulated with chestnut-brown most densely on the darker portions. The FEMALE too is subject to variation; in Burman specimens the hindwing is often suffused more or less, (sometimes entirely, the tawny colour being wholly displaced), as in *Danaus alcippus* with white on both sides over the whole tawny area; on the underside the subcostal whitish spot is sometimes prominent, often totally absent, in some specimens from Calcutta the underside is more like that of the male, the basal area is darker; beyond this there is a distinct paler band, and then the dark border on the margin; the whitish triangular patch near apex of forewing is distinct, and the spots near the outer margin of both wings are distinct and well separated.

E. undularis is the common *Elymnias* of Northern India, and is the most wide-spread of all the species; it is common in the warm valleys of the outer Himalayas, as far east as Mussoorie at all events. In Bengal, where the rainfall is heavy, it extends into the plains, and is found in Assam, Sylhet, Eastern Bengal and along the East Coast as far south as Rajahmundry on the Godavari at all events; and it also occurs in the Deccan, to the south and south-west it is replaced by another species, *E. reticulata*, on the east it extends through Arakan and Tenasserim. In the Malay Peninsula it appears to be replaced by *E. discrepans* and *E. nigrescens*, as it is not included in Distant's Rhopalocera Malayana, but it reappears in Java with but little modification from the original type. Like all other species of the genus it affects bush jungle and shady undergrowth.

The figure shows the upperside of both sexes from specimens taken at Calcutta. A structural figure of the imago of this species is also given on PLATE I, copied from Horsfield's plate.

257 *Elymnias tinctoria*, Moore.

E. tinctoria, Moore, Proc. Zool. Soc. Lond., 1878, p. 826.

HABITAT: Metan, 3,000 feet, April, Moolai, 3,000 to 6,000 feet, Upper Tenasserim.

EXPANSE: 3 inches.

DESCRIPTION: "Allied to *E. undularis* of India. MALE UPPERSIDE dark blue-black, the marginal blue spots on the forewing larger, the border of the hindwing dusky purple, with a series of small white spots. FEMALE with prominent blue-black borders and white markings" (Moore, l. c.).

We have never seen this species; of all the numerous specimens of *E. undularis* we have received from Tenasserim none have the border of the hindwing 'dusky purple,' in all it is some shade of ferruginous, and none of them are separable from *E. undularis*.

Two more varieties of this species have been separated under the names of *E. discrepans*, Distant*; and *E. nigrescens*, Butler†, both of them occur in the Malay Peninsula, the males

* *Elymnias discrepans* Distant. Ann. and Mag. of Nat. Hist., fifth series vol. ix, p. 377 (1882). HABITAT: Penang, Province Wellesley. EXPANSE: 2.70 to 2.95 inches. DESCRIPTION: "MALE UPPERSIDE, forewing blackish, with the following bright bluish markings—a short portion of the costal area about apex of the cell continued in a subapical oblique fascia to the lower discoidal nervule, and followed by four submarginal spots, placed between the nervules; the outer margin shaded with castaneous-brown. Hindwing blackish, but somewhat paler than the forewing and with a broad castaneous brown marginal band. UPPERSIDE, both wings castaneous-brown, thickly mottled with pale strigæ. Forewing with a more or less distinct pale apical area, which is continued along the outer margin. Hindwing with a more or less distinct, pale, broad, and irregular submarginal fascia, and with a very pale bright bluish spot near the costa, situated between the subcostal nervules (this spot is sometimes absent). Body and legs more or less concolorous with the wings. Antennæ variable in hue, sometimes stramineous, mottled with brown above and pale stramineous beneath, or fuscous above and stramineous mottled with brown beneath with the apex pale stramineous. FEMALE, UPPERSIDE, forewing as in the male but with a large ochraceous basal area which occupies the lower portion of the cell, the greater part of the space between the second median nervule and the submedian nervule, and terminates near the end of the cell and the bases of the third and second median nervules; the subapical fascia and submarginal spots larger and paler due in colour. Hindwing pale fuscous, becoming paler and shaded with dull ochraceous towards the outer margin, and with a more or less distinct pale submarginal spot, situated between the discoidal and third median nervules. UNDERSIDE much paler than in the male. Forewing ochraceous near the inner margin. Hindwing with a very broad and well-defined pale marginal fascia, and with a very pale bluish spot, situated as in the male. Body and legs more or less concolorous with the wings." (Distant, Rhop. Malay, p. 60, pl. vi, figs. 2, male, 3, female (1882), l. c.).

† *Elymnias nigrescens* Butler, Proc. Zool. Soc. Lond., 1874, p. 399, n. 2, pl. xlii, fig. 1. HABITAT: Malay Peninsula, Bulimah, Siam. EXPANSE: Male, 2.9; female, 2.6 to 3.1 inches. DESCRIPTION: "MALE: Upper and underside, both wings resembling those of the male of *E. discrepans*, but with the bluish subapical fascia and submarginal spots considerably larger. (In some specimens, and notably a Burman one in the collection of the British Museum, the hindwing has the pale submarginal spots, as found in male females; these

are scarcely distinguishable from some Indian examples of *E. undularis*, but the females are in both cases widely different from that sex of *E. undularis*; whereas in the variety from Ceylon, *E. fraterna*, it is the male sex that is differentiated, the female being scarcely distinguishable from that sex of *E. undularis*. In *E. discrepans* the female is only partially differentiated from the male insect, while in *E. nigrescens* the female closely resembles the male in general style of colour.

258. *Elymnias fraterna*, Butler.

E. fraterna, Butler, Proc Zool Soc. Lond., 1871, p. 520, pl. xlii, fig. 3, male; id., Moore, Lep. Ceylon, vol. 4, p. 25, pl. xiii, figs. 1, male, 10, female, 16, larva and pupa (1880).

HABITAT: Ceylon.

EXPANSE: ♂, 2.65 to 3.1; ♀, 3.0 to 3.4 inches.

DESCRIPTION: "MALE. UPPERSIDE dark purple-brown. Forewing with the exterior margin slightly fulvous; an oblique subapical indistinct blue maculated fascia. Hindwing with a broad fulvous marginal band having paler centres between the nervules. UNDERSIDE dark purplish-ferruginous, a triangular apical space and outer borders broadly covered with numerous grey-brown strigæ, the basal areas also with more regularly disposed strigæ, a distinct bluish-white spot on the anterior border of the hindwing. FEMALE. UPPERSIDE blackish purple-brown. Forewing with the basal and discal areas fulvous, a subapical oblique purple-white fascia and three lower marginal spots. Hindwing with the basal and discal area fulvous, the median nervules and abdominal area grey-speckled, a marginal row of four bluish-white spots. UNDERSIDE as in the male, but paler, the basal area slightly fulvous, and the strigæ on the borders more prominent" (Moore, l. c.).

"LARVA elongated, slightly thickened in the middle, pubescent; head small, yellow, surmounted by two pink pubescent processes, last segment also with two processes; green, with three lateral yellow lines, the upper line ornamented with chrome-yellow spots, and the fifth to eighth segments with a red or blue spot. Feeds on *Palmaceæ*. PUPA green, with longitudinal yellow streaks bordered by red streaks or spots, head and thorax flattened, with three short tubercles." (Moore, l. c.).

E. fraterna is nothing more than a local variety of *E. undularis*; the females are indistinguishable, but the males have the ferruginous border of the hindwing narrower and brighter, and scarcely any trace of the bluish marks on the forewing; the underside is also paler. A specimen of *E. undularis* from Akyab in British Burma, taken by Captain C. H. E. Adamson, approaches more nearly to *E. fraterna* than any continental specimen we have seen.

259 *Elymnias cottonis*, Hewitson.

Melanitis cottonis, Hewitson, Ann. and Mag. of Nat. Hist., fourth series, vol. xiv, p. 358 (1874). *Elymnias cottonis*, Wood-Mason and de Nicéville, Journ. A. S. B., vol. 1, pt. 11, p. 245 (1881).

HABITAT: South Andamans.

EXPANSE: ♂, 2.5; ♀, 3.1 inches (Hewitson), 3.00 to 3.35 inches.

DESCRIPTION: "MALE. UPPERSIDE dark red brown. Both wings with the outer margins rufous. Forewing with the costal margin lilac blue. UNDERSIDE as above, undulate with

are very faintly visible in Malacca male specimens in the same collection) FEMALE: UPPERSIDE, forewing dark glossy fuscous with the basal area more or less suffused with castaneous red, with the bluish subapical fascia and submarginal spots as in the male, but which are much larger and paler in colour. Hindwing fuscous, becoming paler towards the outer margin (the outer margin is sometimes dull ochraceous), and with a submarginal row of four white spots placed between the nervules, of which the first and smallest is placed above the discoidal nervule, and the fourth is situate between the second and third median nervules (a fifth small and faintly marked spot is found in some specimens between the third median nervule and submedian nervure). These spots are very inconstant, being practically obsolete in some specimens. UNDERSIDE similar in pattern and colouration to that of the same sex of *E. discrepans*."

"This species or race is one which affords much difficulty and doubt as to its distinctive position. I have neither seen nor received any male specimens from Province Wellesley though females are not uncommon from that district. The British Museum, however, possesses several male specimens which were collected by Captain Finwill in Malacca, but these do not altogether agree with the Bornean typical specimen described by Butler. The difference is principally that of faintness or partial obliteration of the submarginal white spots to the hindwing, but as this is a variable character in female specimens collected in such a limited area as Province Wellesley, I naturally predicate the same amount of variability in the other sex. Another peculiarity of *E. nigrescens* is the considerable similarity of the sexes. Are *E. discrepans* and *E. nigrescens* but seasonable varieties of one species? This is neither impossible nor improbable." (Distant, Rhop. Malay., p. 61, pl. vi, fig. 1, male; pl. ix, fig. 1, female (1882). There is a single specimen of a female of this species in the Indian Museum, Calcutta, from Sinki Island, which agrees very closely with Distant's description and figure.

grey, the outer margins broadly undulate with grey and brown. *Forewing* with a large triangular grey spot, undulate with brown near the apex. *Hindwing* with a white spot near the middle of the costal margin. FEMALE like the male, except that it is much larger and paler, and that the *forewing* has, on the UPPERSIDE, some grey spots on the costal margin. I prefer to consider this a distinct species rather than to place it as a variety of *M. [E.] undularis*. Both sexes are alike, are without spots, and have a broad rufous margin. (Hewitson, l. c.) This species evidently belongs to the *undularis* group, as it has, like that species and *E. fraterna*, a patch of loosely attached scales at the base of the interspace between the median and submedian nervures on the upperside of the forewing of the male.

"Hewitson states that the sexes are alike in this species, but the three FEMALES before us have the outer margins on the UPPERSIDE of both wings lighter, with a more or less distinct submarginal rounded-angulate macular band in the *forewing*, corresponding to the band of blue spots in the male of *E. undularis*, and in two specimens two, and in the other four, distinct whitey-brown spots, the blurred pupils of the obsolete ocelli of the underside showing through, on the *hindwing*. UNDERSIDE much lighter than in the male, the subapical triangular patch of lilacine ground-colour, in the *forewing*, and the submarginal lilacine ground of both wings, but especially in the *hindwing*, being whiter, and consequently more distinct than in the male; there are also six pupils of ocelli instead of one distinctly traceable, and the anastomosing chestnut striation besides being lighter is less confluent. The female, in fact, much resembles the male of *E. undularis*. Hewitson makes no mention of the beautiful rich deep plum-colour which suffuses the dark parts of the upperside in both sexes almost equally, nor of the faint red-violet reflections emitted by the light borders. *Danaë chrysippus*, the model of the females of the allied continental form, has not yet been detected at Port Blair." (Wood-Mason and de Nicville, l. c.)

This species is apparently common at Port Blair, but it does not occur at the Nicobar Islands. Mr. de Roepstorff has sent us numerous specimens taken in all the months between April and August.

260 *Elymnias penanga*, Westwood

Melanitis penanga, Westwood, Gen. D. L., p. 405, n. 9, note (1851), *Melanitis melinda*, Hewitson, Ex. Butt., vol. iii, pl. *Melanitis*, figs. 2 and 3 (1863), male, *Elymnias melinda*, Wallace, Trans. Ent. Soc. Lond., 1869, p. 323, n. 5, id., Butler, Proc. Zool. Soc. Lond., 1871, p. 523, n. 16 *Elymnias penanga*, Wallace, l. c., p. 325, n. 9, id., Butler, l. c., p. 521, n. 8, id., Distant, Knop. Malay., p. 63, pl. vii, fig. 6, male; pl. vi, fig. 11, female (1882).

HABITAT: Upper Tenasserim; Province Wellesley; Malacca; Singapore.

EXPANSE: ♂, 2.7; ♀, 2.8 inches.

DESCRIPTION: "MALE. UPPERSIDE, *forewing* purplish brown, with very strong bright blue reflections, which become more fixed and distinct on the apical half, and with five pale blue elongate spots, of which the upper two are longest, and are situated on each side of the lower discoidal nervule; the remaining three being much smaller, and divided by the median nervules. The bluish reflection does not extend to the outer margin, which is distinctly purplish brown. *Hindwing* purplish brown, with bright bluish reflections, but less intense than on the forewing. UNDERSIDE casaneous-brown, much mottled with paler strigæ, which on the *forewing* forms a more or less distinct subapical space, widest at the costa, and narrowing downwards beneath the cell; the space beneath the third median nervule much paler. *Hindwing* with the basal portion to a little beyond the apex of the cell dark castaneous, the remainder much paler and thickly marked with the pale strigæ, and with two or three small but distinct dark submarginal spots situated between the median nervules; a somewhat large pale stramineous* spot, near the costa, placed between the subcostal nervules. *Body* and *legs* more or less concoloured with the wings. FEMALE. UPPERSIDE, both wings obscure bluish brown in some specimens, or with brighter indigo shadings in other specimens. *Forewing* crossed by a broad subapical white fascia, commencing at the costa, and terminating about the second

* STRAMINEOUS, straw coloured (*stramineus*, made of straw).

median nervule. *Hindwing* slightly darker on the disc. **UNDERSIDE** marked generally as in the male, but with the ground-colour much darker (this is somewhat variable, being little paler than above in some specimens, or more shaded with castaneous, in other specimens), and with the subapical whitish fascia of the forewing above, more diffused towards the apex beneath. The pale subcostal spot on the underside of the hindwing of the male is generally absent in the female, though present in the typical form of the species contained in the British Museum."

"The male form here described and figured was described by Mr. Hewitson under the name of *M. mehida*, whilst the female form is the typical *M. penanga* of Professor Westwood. Mr. Hewitson appended to his description of *M. mehida* the remark :—"This and *M. penanga* are very probably the sexes of one species." The form, however, which is figured as *M. penanga* was a closely allied but distinct Sumatran race, which Mr. Wallace has very properly separated under a distinctive name [*E. sumatrana**]. The two forms, however, are sufficiently similar to show that Hewitson exhibited acumen in making that remark. Having found all the specimens I have examined to exhibit sexual constancy with the different colouration, and as the undersides of the two forms are so very similar, I have felt constrained to consider the descriptions of both Westwood and Hewitson as referring to the sexes of one species, and Westwood's name has therefore priority. This race or species appears to be confined to the Malay peninsula." (*Distant*, l. c.).

A single male specimen of *E. penanga* was taken by Capt. C. H. E. Adamson in Upper Tenasserim in April, 1880; this is the only record of its occurrence beyond the limits of the Malay peninsula. Capt. Adamson remarks that the comparatively great length of the forewing is not noticed by Mr. Distant, though his figure does show a slightly pointed apex. We have never seen a specimen of this butterfly, the even outer margin of the forewing without dentations is a very marked feature.

261. *Elymnias caudata*, Butler.

E. caudata, Butler, Proc. Zool. Soc. Lond., 1871, p. 520, n. 5, pl. xli, fig. 4, male.

HABITAT : South India.

EXPANSE : 3·15 to 3·60 inches.

DESCRIPTION : **MALE** : **UPPERSIDE**, *forewing* velvety purplish black, the basal area and outer margin tinged with ferruginous brown; an oblique subapical band divided by the dark nervules, and three submarginal spots, one below each median nervule, white, irrorated at the edges with lilac. *Hindwing* ferruginous-brown, darkest at the base, a broad fulvous band on the outer half, and the margin beyond broadly brown; this colour extending up the nervules, widest towards the margin. **UNDERSIDE** chestnut-brown, covered with darker chestnut coarse confluent strizæ. *Forewing* with pure white and greyish partly confluent strizæ disposed in a triangular apical patch, and an irregular submarginal band. *Hindwing* with a broad band on the outer half of similar partly confluent white and greyish strizæ, corresponding with the fulvous band on the upperside, but reaching both costal and inner margins; occasionally a few greyish strizæ on the basal half; but the silvery whitish subcostal spot so prominent in *E. undularis* and other species is wanting. **FEMALE** as in *E. undularis*, female, but the *forewing* with the subapical white band broader. *Hindwing* with the nervules broadly defined with brown, the fulvous patch extending in streaks between them much nearer to the margin, and coalescing with the whitish submarginal spots, which are obsolete, tinted with fulvous and merged

* *Elymnias sumatrana*, Wallace, Trans. Ent. Soc. Lond., 1869, p. 325, n. 10; *Melanitis penanga*, Hewitson, Ex. Rutt., vol. iii, pl. *Melanitis*, figs. 3, 4 (1863), female. **HABITAT** : Sumatra. **EXPANSE** : 3·1 inches. **DESCRIPTION** : "FEMALE, **UPPERSIDE**, both wings dark brown, blue-green from the base to the middle. *Forewing* crossed near the apex by a broad band of white. *Hindwing* with a large white spot beyond the middle. **UNDERSIDE** with the basal half red-brown; the outer half grey, undulated throughout with brown. *Forewing* with a large white triangular spot on the costal margin from its middle to the apex. *Hindwing* with an indistinct pale spot near the base." (*Hewitson*, l. c.).

"This species is remarkably like *M. penanga*, but as the conspicuous golden-yellow spot on the costal margin of the underside of the hindwing is entirely absent, and as it also differs in the white patch on the upperside of the hindwing, and in its somewhat more angular outline, I feel compelled to separate it." (*Wallace*, l. c.).

into the streaks. **UNDERSIDE** much as in the male, but paler and very similar in both sexes to the underside of *E. undularis*, female, but the white striation, especially on the hindwing, is far bolder. Mimics *Danaus (Salatura) genutia*. The tail is also longer than in *E. undularis*, and the outer margin of the forewing more scalloped. It appears to belong to a different group, as there is no patch of loosely attached scales on the upperside of the forewing in the male.

E. caudata is a very handsome and distinct species; it has only been found in the south of peninsular India, the male was originally recorded from Canara; the female has never been previously described. Mr H S Fergusson has taken both sexes in Travancore on the Ashambo hills, where it is fairly common in April and May. The Indian Museum has specimens from Calicut, the Wynaad, and the Kadu district in Mysore.

The next two species belong to the group of which *E. panthera* is the type, and are distinguished by having a more or less distinct submarginal series of ocelli on the underside of the hindwing. This feature is found to a certain extent in *Dyctis singhala*, and to a very much lesser degree in *E. penanga*; while *Dyctis patna* has a submarginal series of white spots representing the ocelli, but in all other Indian species of the subfamily, the series is entirely wanting or only represented by a silvery subcostal spot.

262. *Elymnias mimus*, W.-M. and de N.

E. mimus, Wood-Mason and de Nicéville, Journ. A. S. B., vol. I, pt. II, p. 230 (1881).

HABITAT: Nicobar Islands.

EXPANSE: ♂, 27, ♀, 29 inches.

DESCRIPTION: "MALE **UPPERSIDE**, black fuscous of a fuliginous tint, somewhat paler on the costal margin of the forewing, still paler at the apex of the same wing, and on the outer margins of both wings, the extreme edges and the points of the lobes of which margins are again darker, with the *cilia* whitish on the interspaces. **UNDERSIDE**, both wings brownish, coarsely and confluent striated with rich dark chestnut for their basal two-thirds, whence they become suddenly lighter, owing to the striation being more rare as well as lighter coloured. **Forewing** with the outer margin of the closely striated portion sharply defined, and angulated outwards between the first and second discoidal nervules, and with the ground-colour immediately beyond the anterior and shorter of the two lines forming the angulated outline of the basal portion whitish. **Hindwing** with the ground beyond the chestnut base pale sepia, passing to whitish around the outer-marginal ocelli, obscurely and rarely striated before, but more richly and closely at the outer margin beyond the ocelli with vandyke-brown, and with seven suboval submarginal black ocelli, of which the second is the largest of all but only slightly larger than the fifth, the first is subequal to the sixth, and the third, fourth, and seventh (which touches the sixth in the same interspace) are subequal and much smaller than the rest, the first and second have a white pupil (which in the latter is eccentric) irrorated at the edges with light metallic greenish-blue scales, and the rest have the pupil almond-shaped, with some mauve-coloured irrorations on and around its inner end. **FEMALE:** **UPPERSIDE** much lighter, with a submarginal whitey-brown common band which passes straight across both wings from near the anal angle of the hindwing to the third branch of the median nervure of the forewing, at which point it turns sharply off at a right angle to the costal margin; with the light intervals between the striations of the underside visible as light bars on the anterior margin, and the apical dark portion lighter than the basal of the forewing, and with two infuscations (less perceptible in the darker male) on the hindwing corresponding to the fifth and sixth ocelli of the underside. **UNDERSIDE** lighter, with the chestnut stripes less confluent permitting more of the ground-colour to be seen, and with the anterior ocellus larger and much diffused circumferentially, the second with the pupil rudimentary, and the third larger than the fourth."

"One male from Kar Nicobar and one female from Pulo Kondul."

"Closely allied to *E. dusara (panthera)*, Fabricius, Horsfield, Cat. Lep. E. I. C., pl. v, figs. 7, 7a (1829), female (no description), from which it would appear to differ in having the

light band of the *forewing* distinctly angulated, and the costal margin of the same barred with lighter, in its more highly developed and unequal ocelli, in the more abrupt definition of the basal chestnut from the rest of the underside, and apparently also in its more strongly lobed wing-margins and finer tails. It in all probability mimics *Euplexa caryota*, a species which abounds on all the islands of the Nicobar group" (*Wood-Mason and de Neville*, 1 a.)

Since the above was written, one male from Great Nicobar, two males and a female from Kamorta, two males from Trinkut, and two females from Teiessa, have been received by the Indian Museum, Calcutta, from Mr de Roepstorff. The males are all very constant, but the Kamorta female differs from the Pulo Kondul female in having the apex of the *forewing* more produced, and the submarginal band on the upperside of both wings hardly lighter than in the males. On the underside the ocelli are also much smaller than in the type specimen.

263. *Elymnias obnubila*, Marshall, n. sp.

HABITAT: Upper Tenasserim; Mergui.

EXPANSE: ♂, 2.4, ♀, 3.0 inches.

DESCRIPTION: MALE: UPPERSIDE dark velvety chestnut-brown glossed with violet in certain lights, with a much paler outer band from beyond the middle of the costa of the *forewing* to the inner margin of the hindwing, inwardly diffused outwardly extending to the margin, except at the apex of the *forewing*, which is suffused with dusky. UNDERSIDE dark grey, closely undulated with broad chestnut-brown stræ except upon the area corresponding with the pale band of the upperside, on which the undulations are much finer and wider apart. *Forewing* with a conspicuous whitish triangular costal patch near the apex; the hinder angle tinged with yellow. *Hindwing* with a submarginal series of six black spots with silvery pupils; the first near the costa having the silvery pupil very large, scarcely ringed with black. FEMALE larger, paler. UPPERSIDE with the pale band much wider, occupying on the hindwing the whole of the outer half. A submarginal series of four dark brown obsolete dots, corresponding to the ocelli on the underside. UNDERSIDE also paler. *Hindwing* with the silvery subcostal spot larger, the rest of the ocelli smaller and imperfect, being reduced to blackish dots with faint white irrorations on the inner edge. Shape, as in *E. undularis*, but the inner margin of the *forewing* longer, the outer margin more erect, straight, more prominently dentate, and the hindwing more prominently tailed. This is the continental representative of *E. panthera*, Fabricius, from Java, it differs from *E. panthera* in shape, in having the outer margin straight, not convex, and the inner margin longer, and in markings, in that on the upperside the pale band is broader and continued to the margin, and of a rich bright chestnut colour, and bears no spots on the hindwing in the male, though the female has a series of four very obscure spots, whereas in *E. panthera* the outer margin is broadly clouded with dusky brown, and the hindwing has three small submarginal ocellular spots; and on the underside similarly the pale band formed by the partial absence of stræ is narrow and submarginal in *E. panthera*, broad and marginal in *E. obnubila*, as *E. panthera* also the white triangular patch of the *forewing* is obsolete, and the ocelli of the hindwing are larger, the first near the costa being like the others instead of having the silvery pupil greatly predominating.

Only two specimens of this rare species have as yet been taken so far as we know; a single male now in the Indian Museum, Calcutta, was taken by Dr. J. Anderson in the Mergui Archipelago in January; and a single female, now in Major Marshall's collection, was taken by Captain C. T. Bingham in the Thoungyeen forests in Upper Tenasserim in December.

E. panthera, Fabricius, is figured by Horsfield in his Cat. Lep. E. I. C., pl. v, figs. 7, 7a (1828), female, under the name of *Melanitis dusara*. Mr Wallace remarks of it that "the female is like the male, but the pale bands are broader and somewhat yellower, and contain three or four pale spots on the hindwing; the species varies but little, and seems to be very constant in both sexes, with but little difference between them." (*Trans. Ent. Soc. Lond.*, 1869, pp. 322, 323).

*E. lutescens** also belongs to this group. It is very closely allied to *E. mimus*, and differs from that species on the upperside in the forewing being but slightly paler on the margins, and having no submarginal paler band; the band on the hindwing is, however, much more prominent, and bears a submarginal row of spots. Underside very similar, the ocelli rather smaller.

264. *Elymnias leucocyma*, Godart. (PLATE XVII, FIG. 60 ♂ ♀).

Biblis leucocyma, Godart, Enc Méth., vol. ix, p. 326, n. 3 (1819); *Dytis leucocyma*, Moore, Proc. Zool. Soc. Lond., 1878, p. 826; *Melanitis malelas*, Hewitson, Ex. Butt., vol. iii, pl. *Melanitis*, figs. 6, 7 (1863), male.

HABITAT: North-Eastern India, Arakan, Tenasserim.

EXPANSE: 3·2 to 4·2 inches.

DESCRIPTION: MALE: UPPERSIDE velvety blackish brown, the outer two-thirds beautifully shot with violet in certain lights; a submarginal series of paler violet irrorated spots, and four similar spots on the disc, two beyond the cell below the lower discoidal nervule, and one between each pair of median nervules. Hindwing brighter brown, paler externally, and with or without a submarginal series of small ashy dots. UNDERSIDE pale brown, closely undulated with greyish yellow strizæ, most densely on the outer two-thirds. FEMALE as in the male, but with the violet shot confined to the outer half of the forewing, the spots white, partially irrorated with violet towards the apex; the whole of the interspaces on the hindwing and below the median nervule in the forewing marked with numerous transverse yellowish-grey strizæ more or less confluent into longitudinal streaks. UNDERSIDE as in the male, but with the pale strizæ much wider and whiter. Mr. Wallace (Trans. Ent. Soc. Lond., 1869, p. 327) considered *E. malelas* distinct from *E. leucocyma*, and remarked, "allied to *E. leucocyma*, but differing in the smooth outline of the wings, and the produced outer angle of the hindwing." There can be but little doubt, however, that they are one and the same species.

E. leucocyma in both sexes is an excellent mimic of *Euplexa midamus*; its highly elongate forewing distinguishes it from all other species of the subfamily. It is common in the submontane districts of Northern and Eastern Bengal, extending through Burma as far south as Tavoy, but not apparently into the Malay peninsula proper. Mr. T. C. Hill took it in Tavoy in March; Captain C. T. Bingham found it commonly in the Thoungyeen forests in the autumn and again in April; Captain C. H. E. Adamson found it commonly in Moulmein in September, and again at Akyab. Mr. Wood-Mason took it in Cachar in June and July. The Indian Museum, Calcutta, contains specimens from Sylhet and Upper Assam; Mr. de Nicéville has taken it round villages in Sikkim at about 2,000 feet elevation in October; and Mr. E. T. Atkinson records it from Kāli Kumaon on the western border of Nepal.

The figure shows the upperside of a male specimen from Sylhet, and of a female from Sibsagar, Upper Assam, both in the Indian Museum, Calcutta.

The next species, *E. saueri*, differs from all the foregoing in the pattern of the underside, which is marbled throughout, with no definite pattern and no defined spots on either wing, and no paler nebulous outer band.

* *Elymnias lutescens*, Butler, Ann. and Mag. of Nat. Hist., third series, vol. xx, p. 404, pl. ix, fig. 10 (1867), female; id., Wallace, Trans. Ent. Soc. Lond., 1869, p. 323, n. 4, id., Butler, Proc. Zool. Soc. Lond., 1871, p. 521, n. 6; id., Distant, Rhop. Malay., p. 61, pl. vi, figs. 4, male; 5, female (1882). HABITAT: Penang; Province Wellesley; Malacca, Ayerpanas, Singapore, Sumatra; Borneo. EXPANSE: 3·0 to 3·2 inches. DESCRIPTION: MALE: UPPERSIDE, both wings dark glossy fuscous. Forewing with the outer margin somewhat broadly and slightly paler. Hindwing with a broad, pale greyish submarginal fascia, the inner margin of which is somewhat scalloped between the nervules, this is broadest near the anal angle and narrowest at the apex, and contains a series of prominent fuscous spots placed between the nervules, two between first median nervule and submedian nervule, the others placed singly (these spots are variable in number, not being found above the third median nervule in some specimens, but in other specimens continued towards the apex). UNDERSIDE, both wings pale castaneous, mottled with numerous greyish strizæ, and with a more or less well-defined broad submarginal fascia, which is broadest and most clearly defined on the hindwing, and there possesses six dark blue rounded spots, with pale blue centres, which are continued in streaks beyond the inner margins; these spots are placed between the nervules, the first above the discoidal nervule, and the fifth and sixth together between the first median nervule and the submedian nervule; a pale and bright bluish spot between the subcostal nervules. Body and legs more or less concolorous with the wings. FEMALE larger than the male. UPPERSIDE paler and more ferruginous. Forewing with a broad and well-defined outer ferruginous fascia. Hindwing with the pale submarginal fascia broader and less scalloped inwardly than in the male, and with five or six fuscous spots with paler centres placed between the nervules. UNDERSIDE paler than in the male, but with the hindwing spotted as in that sex. The tail-like prolongation of the hindwing at the apex of the third median nervule is longest in the female. (Distant, l.c.)

265. *Elymnias saueri*, Distant.*E. saueri*, Distant, Rhop. Malay., p. 65, pl. ix, fig. 3 (1889), male.

HABITAT: Tenasserim; Malay Peninsula.

EXPANSE: ♂, 3.55 inches.

DESCRIPTION: "MALE: UPPERSIDE, *forewing* dark violaceous, with paler suffusions on the apical area, and with the following very pale violaceous spots:—Three discal; one large, placed between the third and second median nervules, the others exceedingly small and indistinct, and situated between the discoidal nervules, and between the second and first median nervules; five large submarginal spots divided by the nervules, of which the two upper, inner, and largest are contiguous and separated by the lower discoidal nervule, the fifth being situated between the first median nervule and the submedian nervule; there is also a very faint indication of a spot at the end of the cell. Costal area with the basal third minutely spotted with greyish, the remaining portion with three or four pale bluish spots. *Hindwing* castaneous, with the basal area fuscous. The extreme margins of *both wings* are alternately fuscous and white. UNDERSIDE pale ferruginous, thickly mottled with dark chocolate-brown strigæ, irregular in shape and size. *Forewing* with a number of pale greyish spots on the costal area; the upper portion of the cell and the apical area somewhat paler in hue, and with indications of a dark waved fascia near the end of the cell. *Hindwing* somewhat darker, the strigæ being more numerous and contiguous, with indications of a much-waved and irregular dark fascia crossing the wing about the end of the cell, and a more or less distinct, broad, submarginal fascia, followed by several waved, broken, and indistinct lines. *Body and legs* more or less concolourous with the wings."

"This fine species is somewhat intermediate between *E. casiphonæ*" and *E. leucocyma*, agreeing best with the latter above, and with the first beneath. It appears to be a mimic of a species of *Euplexa* belonging to the *midamus* group, though the female still remains to be discovered. Since this description was written, a specimen collected by Captain Bingham in Tenasserim has been presented to the British Museum." (*Distant*, l. c.)

We have never seen this species, and the above record is the only one of its occurrence within our limits.

The next species, *E. timandra*, is of very different style of colouration and outline. The type of the group is *E. lais*, Cramer, from Java, Sumatra and Borneo, and also from the Malay Peninsula. The upperside has on both wings the nervures and the outer margin broadly defined with blackish brown, and the interspaces white tinged with creamy or yellowish or grey or verditer blue. They mimic species of *Danaïs* of the *Limniæ* group. *E. timandra* chiefly differs from *E. lais* in the more dentate outline of the outer margin of the forewing, and the basal area of both wings on the underside is much darker.

* *Elymnias casiphonæ*, Hübner, Samml. Ex. Schmett., vol. iii, pl. xviii? (1816-1834); id., Butler, Trans. Ent. Soc. Lond., 1879, p. 488; idem, id., Proc. Zool. Soc. Lond., 1871, p. 552, n. 14; idem, id., Distant, Rhop. Malay., p. 64, pl. vi, fig. 10 (1889), male. HABITAT: Singapore, Java. EXPANSE: male, 3.00; female, 3.25 inches. DESCRIPTION: "MALE: UPPERSIDE, *both wings* pale chocolate-brown. *Forewing* with the apical area much suffused with violaceous, and with the following pale greyish macular markings: a number of irregularly-shaped and shaped spots on the costal area, gradually increasing in size from the base; a rounded spot just beyond the end of the cell; two discal spots divided by the second median nervule, and a submarginal series of six spots, divided by the nervules, the first and innermost of which is placed above the upper discoidal nervule, and the sixth between the first median nervule and the submedian nervule. *Hindwing* with a submarginal series of obscure greyish spots, preceded by a few discal spots of the same colour. UNDERSIDE pale ferruginous, mottled with numerous and irregularly-sized chocolate strigæ. *Forewing* with a costal series of pale greyish spots; four larger pale discal spots situate one beyond the end of the cell, two divided by the second median nervule, and the fourth placed between the discoidal nervules; there are also faint indications of a submarginal series of spots placed between the nervules, of which the two most prominent are placed above and beneath the first median nervule. *Hindwing* with some dark and confluent strigæ principally distributed on the basal half, and with a prominent dark submarginal fascia, which is preceded by pale greyish, and followed by several narrower, waved, and somewhat fused dark marginal fasciæ. *Body and legs* more or less concolourous with the wings." (*Distant*, l. c.) "FEMALE: UPPERSIDE, same pattern as *E. timandra*, female, Wallace, but the whole apical area pale violet, and the rest of the ground-colour of a browner tint than in that species. UNDERSIDE, markings the same as in the male, but ill-defined, the *hindwing* whitish." (*Butler*, l. c., in Trans. Ent. Soc. Lond.)

266. *Elymnias timandra*, Wallace.

E. timandra. Wallace, Trans. Ent. Soc. Lond., 1869, p. 326, n. 13.

HABITAT: Sylhet; Tenasserim.

EXPANSE: 3.0 to 3.7 inches.

DESCRIPTION: "Like *E. lais**; outline of the wings more dentate, especially on the hindwing. MALE. UPPERSIDE like *E. lais*, but the markings broader, and of a rich verditer blue on the forewing. UNDERSIDE, the base of the wings is much darker. FEMALE. Wings more elongate; markings pale ochre, tinged with bluish on the forewing, the tooth at the outer angle of the hindwing forming a short tail."

"Very closely allied to *E. lais*, but the different outline of the wings, and distinct colouring, render it necessary to separate it." (Wallace, l. c.)

The Indian Museum, Calcutta, contains specimens from Sylhet, and Captain Bingham took a single male in the Donat range in Tenasserim in April, and one female was taken at Kanhlete by Captain Adamson in September. Wallace also records it from Moulmein, but it is apparently a rare species. On the upperside the Sylhet males are decidedly marked with green, while the Tenasserim males are equally decidedly blue, and the forewing is somewhat longer proportionally than the Sylhet males.

E. casiphone has been recorded from Singapore. On the underside it is marked very similarly to *E. lais*, but the general tone of the ground-colour is more rufous; on the upperside, however, it is very different. It is intermediate between *E. saueri* and *E. lais*.

Genus 32.—DYCTIS, Boisduval. (PLATE XVII.)

Dyctis, Boisduval, Voy. de l'Astrolabe, p. 138 (1832); id., Westwood, Gen. D. L., p. 353 (1851); id., Butler, Proc. Zool. Soc. Lond., 1871, p. 523.

Differs from *Elymnias* (restricted) in having the lower disco-cellular nervule of the hindwing straight or feebly concave in continuation of the upper disco-cellular nervule.

The full diagnosis of *Dyctis* as given by Mr. Butler is appended below;† but the sole reliable feature on which the distinction can be maintained is the shape of the discoidal cell in the hindwing as indicated above. The hindwing in *Elymnias* restricted also has a false prediscoidal cell; the position of the origin of the first subcostal nervule is inconstant, in most species of *Elymnias* it is nearer to the base of the wing than to the apex of the cell, and in most species of *Dyctis* it is nearer to the apex of the cell than to the base of the wing, but no tangible line of separation can be drawn; the distance between the origin

* *Elymnias lais*, Cramer, Pap. Ex., vol. ii, pl. ex, figs. A, B (1777), male; *Biblis lais*, Godart, Enc. Méth., vol. ix, p. 326, n. 4 (1819); *Elymnias lais*, Wallace, Trans. Ent. Soc. Lond., 1869, p. 325, n. 11, id., Distant, Rhop. Malay, p. 62, pl. ix, fig. 2 (1889), male. HABITAT: Province Wellesley; Sum; Malay Archipelago. EXPANSE: 3 inches. DESCRIPTION: "MALE: UPPERSIDE, both wings dark chocolate brown, variegated with greenish markings. Forewing with the costal area (particularly the basal portion) irrorated with numerous greyish spots and strigæ; a large greenish fascia in the cell, narrowest at the base, and widened and somewhat truncate near the apex, and with the following longitudinal fasciæ of the same colour placed between the nervules.—The upper two are placed above and below the first discoidal nervule, and are very faint and slender, with their apices broad and macular, the third above the third median nervule is slender, but macular at both ends, and inwardly approaches the disco-cellular fascia, the following three separated by the median nervules are broadest at base, narrowing at apical portion, but macular at apex, and the last runs along the inner margin. Hindwing with similar longitudinal fasciæ as on the forewing, and which are also placed between the nervules, but are broke, near their apices, which thus appear as a submarginal series of spots; of these fasciæ the inner two (placed on each side of the submedian nervule) are longest, and the upper two (placed on each side of the discoidal nervule) are the faintest; there is also a very faint disco-cellular streak. UNDERSIDE dull greyish, suffused with fuscous, and mottled with dark strigæ; on the forewing these become more or less confluent and dark chocolate in colour, forming an irregular spot in the cell, a larger irregular spot or fascia at the end of the cell, and appearing very prominently towards the outer margin; on the hindwing these darker shadings do not extend beyond the basal half of the wing, but again appear as a more or less well-defined outer submarginal fascia. Body and legs more or less concoloured with the wings. FEMALE, somewhat larger than the male, the fasciæ and spots of the UPPERSIDE being creamy in hue, and with the outer margins of both wings distinctly and somewhat brightly castaneous. UNDERSIDE, both wings much paler, and the numerous shadings are of like pattern but fainter impression." (Distant, l. c.)

† *Dyctis*, Butler. "Forewing as in *Elymnias*; hindwing with a false prediscoidal cell; the first subcostal nervule emitted towards the end of the cell, nearer to the end in the females than in the males; second and discoidal nervules emitted somewhat near together; upper disco-cellular nervule more or less oblique, slanting outwards; lower disco-cellular feebly concave or angulated, and about twice the length of the upper one; second and third median nervules emitted near together." (Butler, l. c.)

of the second branch and that of the discoidal nervule scarcely differs at all throughout the subfamily; and throughout the subfamily also the second and third median nervules are emitted close together at the apex of the cell.

Of the five Indian species placed in this genus, three (*D. esaka*, *D. patna* and *D. vasudeva*) were included in it by Mr. Butler; one, *D. singhala*, subsequently described, was classed by Mr. Moore as an *Elymnias*, and one, *D. peali*, has only just been discovered. The two latter would seem from their outline and markings to belong to *Elymnias*; *D. singhala* is identical in outline with *E. lutescens*, and only differs from it, in having the pale band on the upperside composed of partially confluent strizæ and without black submarginal spots, and the underside with the ocelli minute and obsolescent; and *D. peali* is identical in outline with *E. timandra*; but both *D. singhala* and *D. peali* have the cell of the hindwing formed as in *Dyctis*. The remaining three species have the outline much more even, as in the typical species from the Austro-Malayan region. *D. esaka* is the most typical; *D. vasudeva* somewhat less so, but remarkable from its colouration which mimics some species of *Delias* or other dark *Pieris* with a large patch of white on the hindwing; *D. patna* has the outer margin distinctly, though feebly, dentate, and mimics an *Euplexa* of the *superba* type in colouration.

As far as the females are known they are but little differentiated, whereas in many of the species of *Elymnias* the females differ very considerably in colour and markings from the males.

Key to the Indian species of *Dyctis*.

B. Hindwing with the lower disco-cellular nervule straight or feebly concave.

a. The upper disco-cellular suberect or outwardly oblique, almost in the same line as the lower.

a¹. Forewing elongate, outer margin irregularly dentate and distinctly falcate; hindwing distinctly caudate, (outline exactly as in *E. timandra*).

a². Male, upperside dark violet-black, with a diffused submarginal lavender band on both wings; female unknown.

267. *D. PEALI*, Assam.

b¹. Forewing short broad, outer margin dentate, but not falcate; hindwing dentate and distinctly caudate; (outline much as in *E. caudata*).

b². Male and female, upperside blackish-brown, with a submarginal band of partially coalescent creamy-white or buff strizæ on both wings.

268. *D. SINGHALA*, Ceylon.

c¹. Forewing elongate, but broad; outer margin of both wings even, regularly but not very prominently dentate; (outline as in *E. leucocyma*, but the wings much broader and inner margin longer).

c². Male and female chestnut brown, dark and shot with violet on the forewing. Forewing with longitudinal violet streaks on the disc; hindwing with white submarginal spots.

269. *D. PATNA*, Sikkim, Cachar, Sylhet.

Forewing short broad; outer margin of both wings very slightly dentate; (outline as in *E. cottonis*, but the apex of forewing rounded, not acute).

d². Male and female dark brown, forewing with grey streaks, hindwing with a large white patch on inner half.

270. *D. VASUDEVA*, Sikkim, Tenasserim.

Forewing short, very broad; outer margin of both wings even; outline an arc of a circle with the base of the wings as a centre; the inner margin of forewing and costa of hindwing being both equal to the costa c. forewing.

271. *D. ESAKA*, Meigui.

267. *Dyctis peali*, W.-M.

Elymnias peali, Wood-Mason, Ann. and Mag. of Nat. Hist., fifth series, vol. xi, p. 62, pl. ii, figs. A, B (1883), male.

HABITAT: Aideo, Sibsagar district, Assam.

EXPANSE: ♂, 3.15 inches.

DESCRIPTION: "MALE: UPPERSIDE, both wings violaceous black-blue, gradually darkening from the outer margin to the bases, with the markings deep lavender-blue, and the cilia

between the nervules greyish white. *Forewing* with an oblique subapical band placed nearly at right angles to the complete submarginal series of rather faint and diffused blotches, and the apical subcostal interspace, all lavender-blue, and with the costal and subcostal areas transversely striated with the same colour. *Hindwing* with a corresponding submarginal band, which is very prominent and broken up into coarse striae between the third median nervule and the abdominal margin, towards which it passes from blue into red-violet. *UNDERSIDE* much as in *E. undularis* and its allies, but more richly coloured than in any species of that group."

The type specimen, the only one known, is in the Indian Museum, Calcutta.

268. *Dyctis singhala*, Moore.

Elymnias singhala, Moore, Proc. Zool. Soc. Lond., 1874, p. 568; idem, id., Lep. Cey., p. 26, pl. xiii, figs. 2, male; 2a, female (1880).

HABITAT: Ceylon.

EXPANSE: 3'0 to 3'5 inches.

DESCRIPTION: "MALE: UPPERSIDE dark purple-brown. *Forewing* with a marginal macular band formed of pale greenish-grey quadrate patches, a few ochreous strigæ on the costal margin. *Hindwing* with a broad marginal band of pale greenish-ochreous longitudinally-confluent strigæ. *UNDERSIDE*, basal areas purple-brown, outer areas pinkish-grey, covered with numerous black strigæ, most dense on basal areas and along extreme outer margins; an indistinct purple-white apical spot, and a submarginal row of black dots on the *hindwing*. FEMALE brighter coloured, the marginal bands more prominent." (Moore, l.c., in Lep. Cey.). "Occurs at Kandy." (Wall.). The type specimen was described from Colombo. The Indian Museum, Calcutta, contains a single pair.

269. *Dyctis patna*, Westwood.

Melanitis patna, Westwood, Gen. D. L., p. 405, note, pl. lxxviii, fig. 2 (1851), *Elymnias patna*, Wallace, Trans. Ent. Soc. Lond., 1879, p. 327, n. 17; *Dyctis patna*, Butler, Proc. Zool. Soc. Lond., 1871, p. 545, n. 13.

HABITAT: Cachar; Sylhet; Sikkim.

EXPANSE: 3'35 to 3'95 inches.

DESCRIPTION: "UPPERSIDE fuscous. *Forewing* and the outer angle of the *hindwing* with a slight violaceous sheen, with elongate purple streaks beyond the middle and another in the middle. *Hindwing* with four whitish submarginal dots. *UNDERSIDE* pale fuscous. *Forewing* with three, *hindwing* with seven white dots; the outer margin of the *hindwing* irrorated with white." (Westwood, l.c.) There are two FEMALE specimens of this species from Sikkim in the Indian Museum, Calcutta. They differ from the male in being paler on both upper and undersides, the elongate purple streaks on the upperside of the *forewing* larger and more diffused, and in one specimen there is a submarginal series of five white spots, one in each interspace, except the lower discoidal. They of course lack the sexual glandular patch of scales and tufts of hair on the upperside of the *hindwing* near the costal margin which is present in all the males of this subfamily.

"A fine species, somewhat resembling *Elymnias leucocyma*, but with the spots beneath as in *E. newitsoni* from Macassar and Celebes." (Wallace, l.c.)

"Mimics *Euphaea callithoe*, a species allied to *E. splendens* and *E. superba*; it bears a superficial resemblance to *Elymnias leucocyma*," (Butler, l.c.)

D. patna bears a general resemblance to *Euphaea* of the *superba* type both in form and colour; the *forewing* is tinged with violet, and the *hindwing* with chestnut-brown; the purple streaks on the *forewing* are longest at the costa and extend in a curved regularly decreasing series to the submedian nervure, one in each interspace, except that the streak above the third median nervule is abbreviated or altogether wanting; the patch in the middle is situated at the end of the cell, and is often indistinct; the whitish irrorations of the underside of the *hindwing* are grouped into irregular undulated striae on the outer and abdominal margins of

the *hindwing*, and continued less prominently on to the disc of the *forewing*; in some specimens they are obsolete. It most nearly resembles *E. leucocyma*, but differs in having the wings shorter and broader; on the upperside the discal series of purple spots on the *forewing* far more elongate, the inner series absent; and on the *hindwing* in the presence of the white submarginal spots: and on the underside it has white submarginal spots and the outer margin only variegated, whereas *E. leucocyma* has no white spots, and almost the entire under-surface variegated with pale strise.

It is not a common species, and we have as yet only seen it from Sikkim, Cachar and Sylhet. Mr. de Nicéville took it in the valley of the Great Runj, Sikkim, in October; and Mr. Wood-Mason took a single specimen on Nemotha, Cachar, in September. It most probably mimics *Euplaea* (*Stictoplaea*) *hopei*, which Mr. de Nicéville has taken in Sikkim at the same time and in the same locality.

270. *Dyotis vasudeva*, Moore. (PLATE XVII, FIG. 61 ♂).

Elymnias vasudeva, Moore, Horsfield and Moore, Cat. Lep. F. I. C., vol. i, p. 238, n. 513, *Dyctis vasudeva*, Butler, Proc. Zool. Soc. Lond., 1871, p. 525, n. 16, *Elymnias thycana*, Wallace, Trans. Ent. Soc. Lond., 1869, p. 323, n. 7.

HABITAT: Sikkim, Upper Tenasserim.

EXPANSE: 2.75 to 3.20 inches.

DESCRIPTION: "MALE: UPPERSIDE, *forewing* black, glossed with slaty-blue, costal margin with small bluish-white dots; longitudinal spots in the middle of the wing, and spots from near the apex to the posterior angle bluish-white. *Hindwing*, from the abdominal margin to the middle of the wing, white; anterior and posterior border black, the latter with some marginal white spots. UNDERSIDE white, nervures black. *Forewing* covered throughout with deep black strise [or as Wallace describes it, black, irregularly blotched and irrorated with white]. *Hindwing* with the exterior margin covered with deep black strise; the base of the wing black, with numerous small white spots, and a large red spot below the cell; abdominal margin broadly suffused with yellow" (Moore, l. c.) "FEMALE: UPPERSIDE paler, with the bluish and white portions more diffused. UNDERSIDE very much whiter, with finer irrorations, and the yellow patch more diffused." (Wallace, l. c.) The secondary sexual characters of the male differ from those of all other Indian species of the subfamily, as not only are the usual tufts of hair on the upperside of the hindwing present, but the inner margin of the forewing is folded upwards, and encloses a tuft of long ochreous-brown probably erectile hairs.

"Mimics either *Delias desrombesi* or *D. indica*." (Butler, l. c.) "Pieridæ of the genus *Thyca*." (Wallace, l. c.)

D. vasudeva is not very common, but will probably be found in all the hill ranges between Sikkim and Tenasserim.

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

271. *Dyotis esaca*, Westwood.

Melanitis esaca, Westwood, Gen. D. L., vol. ii, p. 405, n. 10 (1851), note; id., Hewitson, Ex. Butt., vol. iii, pl. *Melanitis*, fig. 5 (1863). *Elymnias esaca*, Wallace, Trans. Ent. Soc. Lond., 1869, p. 322, n. 2; *Dyctis esaca*, Butler, Proc. Zool. Soc. Lond., 1871, p. 523, n. 4.

HABITAT: Assam, Mergui, Borneo.

EXPANSE: 2.3 to 2.5 inches.

DESCRIPTION: "Wings entire. UPPERSIDE blackish, with a slight ochraceous gloss. *Forewing* very broad, almost perpendicularly truncated, with an oblique pale lilasine subapical fascia continued by three spots of the same colour along the outer margin. *Hindwing* with a slight purple gloss, the outer margin grey. UNDERSIDE fuscous, much irrorated with grey. *Forewing* paler about the apex, with two black dots. *Hindwing* with a series of minute black dots." (Westwood, l. c.)

The only other recorded notice of this species is by Hewitson who figures the underside in his "Exotic Butterflies," and adds the following short description, which somewhat differs from Westwood's quoted above. "UPPERSIDE: dark brown; crossed near the outer margin by a curved band of six large ill-defined lilac spots. Hindwing with a marginal band of five indistinct grey spots. UNDERSIDE red-brown, closely undulated throughout with grey. Forewing with the apex nearly white, marked with two black spots. Hindwing with a black spot dotted with white near the costal margin before the middle, and a submarginal band of five black spots indistinctly dotted with white" (Hewitson, l. c.)

The Indian Museum, Calcutta, contains a single male specimen of this rare species, which was taken by Dr. J. Anderson in the Mergui Archipelago on the 20th December, 1881. It is smaller than the types, being 2·3 inches in expanse; the forewing is, as in Hewitson's description, "crossed near the outer margin by a curved band of six large ill-defined lilac spots," the spots near the apex being elongate, almost coalescent, and separated only by the dark nervules; all the spots more or less irrorated with white in the centre; but the hindwing is as in Westwood's description, the outer margin broadly grey, outwardly almost pure white, inwardly diffused and irrorated with lilac; the extreme outer margin is narrowly blackish.

The shape of the wings of *D. esca* is very peculiar, and sufficient to distinguish it at a glance from all other Indian *Elymnina*, indeed from almost every other Indian Butterfly; the costal and inner margins of both wings are all of nearly equal length, so that the outline between the apex of the forewing and the anal angle of the hindwing is an arc of a circle with its centre at the base of the wings.

SUBFAMILY IV.—MORPHINÆ, Butler.

Morphina, Butler, *Cist. Ent.*, vol. 1, p. 3 (1869); id., Kirby, *Syn. Cat. D. L.*, p. 125 (1871). *Morphina* and *Nymphalidae (part)*, Westwood, *Gen. D. L.*, vol. ii, p. 332 (1852); *Morphina*, Distant, *Rhop. Malay.*, p. 67 (1882).

BODY robust, seldom elongate. HEAD usually small, tufted; eyes large, prominent, naked; antennæ long, slender, with a slender very gradually formed club, palpi slender, somewhat elongate, erect (or sometimes porrect), the front edge not dilated, clothed in front with dense appressed scaly hairs, at the back with longer hairs grouped in a tuft against the face. WINGS broad, ample, but varying in outline, generally ocellated on the underside. FOREWING with the nervures usually simple, the costal nervure sometimes slightly and gradually dilated at the base: discoidal cell short, very broad, completely closed by perfect nervules; the apex always beyond the origin of the second median nervule; the first branch of the subcostal nervure long, originating near the end of the cell and often anastomosing with the costal nervure; the remaining branches originating far beyond the cell close together near the apex (except in *Xanthotania* in which they are widely separated); the upper and middle disco-cellular nervules short, the lower very long, outwardly oblique and generally concave. HINDWING with the discoidal cell partially or entirely open, except in *Xanthotania*, where it is completely closed by a very slender lower disco-cellular nervule: no prædisoidal cell; the discoidal nervule appearing as a third subcostal branch; the anal margin broadly channelled and enclosing the entire abdomen. In the male furnished with glands or patches of raised scales or tufts of hair in various positions. FORELEGS of the MALE small, brush-like; those of the FEMALE larger, longer, and less hairy.

"LARVA: with a more or less developed bifid tail" (*Distant*, l. c.) "PUPA: short, thick, cylindrical, or slightly carinated down the back" (*Westwood*, *Gen. D. L.*, vol. ii, p. 332 (1851)).

The *Morphinæ* are confined to South America and the Malayan region, extending in India as far as the Indo-Malayan fauna penetrates. The typical genus *Morpho* is entirely South American, and contains some of the largest and most brilliantly coloured butterflies in the world: all the other genera are Asiatic.

Great differences of opinion have prevailed as to the propriety of separating this group into a subfamily; the original separation was suggested by Doubleday and adopted by Westwood in the Genera of Diurnal Lepidoptera, but with much hesitation, the group as there defined excludes *Amathusia*, *Zeuxidia*, and *Discophora*, which were left with *Kalima* among the *Nymphalina*, and includes many American genera now classed as *Brassolina* in a distinct subfamily. In 1864, Mr. H. W. Bates, in a review (*Journal of Entomology*, vol. ii, p. 177) of the primary and secondary divisions of the suborder, united the *Morphina* with the true *Nymphalina*, with the remark that "they exhibit no good character whereby they may be distinguished from the *Nymphalina*," and the combined group he defined as having the "lower disco-cellular nervule, at least of the hindwing, more or less atrophied." In 1869, Mr. A. G. Butler established the group as it now stands, merely remarking that it "includes the genera *Morpho*, *Clerome*, *Drusilla*, *Discophora*, *Amathusia*, *Bia*, and comes between the *Brassolina* and *Nymphalina*" (*Cistula Entomologica*, vol. 1, p. 3), but giving no distinctive features. In this he was followed by Mr. Kirby in 1871 in his *Synonymic Catalogue of Diurnal Lepidoptera*. And in 1882, Mr. W. L. Distant, in his *Rhopalocera Malayana*, reverted to Mr. Bates' arrangement and united them with the *Nymphalina*, but makes them a separate group, basing the groups on the dilation of the anterior edge of the palpi.

It is true that a strict definition of the subfamily is very difficult, if not impossible, to lay down, but since they do possess features to a large extent distinctive, and as their affinities with the *Satyrinæ* are apparently as great as their affinities with the *Nymphalina*, Mr. Butler's arrangement appears to us the most convenient to adopt until their life history becomes more fully known.

The *Morphinæ* resemble the *Satyrinæ* in having large wings and weak flight; they also love the shade, are chiefly found in undergrowth in forests, and some at least are crepuscular in their habits; the underside of the wings is almost always ocellated; the hindwing of the male always bears more or less pronounced secondary sexual characters; the antennæ are long and very slender, never abruptly clubbed, and the discoidal cell of the forewing is always closed. They resemble the *Elymninæ* in habits and in the brilliant colouring of the upperside; they resemble the *Nymphalina* in having the cell of the hindwing open, except in *Xanthotenia*, but the palpi are not dilated at the base; and lastly the larvæ, so far as they are known, approximate to a type which is dominant among the *Satyrinæ*, but aberrant among the *Nymphalina*. Their distinctive structural features are chiefly in the neurulation of the forewing in which the cell is short (it is long in *Morpho*, but short in all the Asiatic genera) and very broad; the second branch of the subcostal nervure is either wanting altogether or originates far beyond the apex of the cell, and the first and second branches often anastomose with each other, and the costal nervure for a short distance, and then run free to the costa. These with the structure of the palpi separate them from the *Nymphalina*; the open cell in the hindwing separates them from *Satyrinæ* and *Elymnina*; and the want of a prædiscoidal cell in the hindwing separates them from *Elymnina* and *Brassolina* (an American subfamily).

The *Morphinæ* are connected on the one hand with the *Nymphalina* through the genera in which the cell of the hindwing is completely open, and on the other hand with the *Satyrinæ* through *Xanthotenia*, in which the special characters are least developed, it having the cell of the hindwing completely closed. *Amathusia* and *Zeuxidia*, especially the latter, greatly resemble *Kallima* (a genus of *Nymphalina*) in outline; but the arrangement of the subcostal nervules in the forewing, the presence of ocelli, and of the secondary sexual characters on the hindwing of the males at once distinguish them from it.

Key to the Indian Genera of MORPHINÆ.

- A. Antennæ long, slender, with long gradually formed slender club: palpi slender, the anterior edge not widely dilated. Forewing with the costal nervure slightly and gradually dilated at base; the first subcostal branch emitted near the end of the cell, the second (if present) beyond it; the apex of the cell far beyond the origin of the second median nervule. Hindwing with no prædiscoidal cell.

- a. Hindwing with the discoidal cell closed by a very slender lower disco-cellular nervule near the origin of the second median nervule.

- a¹. Forewing, subcostal nervure with its four branches all free.

- a². Forewing with the apex round, outer margin convex. Hindwing with the anal angle rounded, outer margin convex.

XXXIII.—XANTHOTENIA.

Hindwing with the discoidal cell partially closed by an atrophied lower disco-cellular nervule.

- a¹. Forewing, subcostal nervure with four branches, the first anastomosing with the costal nervure.

- a². Forewing with the apex acute; the inner margin convex throughout; the median nervure with the commencement of a fourth branch beyond the apex of the cell. Hindwing with a narrow somewhat acute tail at anal angle.

XXXIV.—ZEUXIDIA.

Hindwing with the discoidal cell completely open, but apparently partially closed by a transverse fold in the wing membrane some distance beyond the origin of the second median nervule.

- a¹. Forewing with the apex slightly rounded, outer margin concave, inner margin slightly convex at base, then straight. Hindwing with either a short broad, or somewhat long narrow tail at anal angle.

XXXV.—AMATHUSIA.

d. Hindwing with the discoidal cell completely open.

Forewing with the apex acute, the outer margin straight or slightly concave.
Hindwing with the anal angle square or acute.

Hindwing with the outer margin angled at tip of third median nervule; forewing, subcostal nervure with four branches of which the first two anastomose. Male with an oval patch of plush-like scales on hindwing upperside.

XXXVI.—DISCOPHORA.

♂¹. Hindwing with the outer margin more regularly convex; forewing, subcostal nervure with three branches only, the first anastomosing, second obliterated. Male without the oval patch of plush-like scales.

XXXVII.—ENISE.

Forewing with the apex acute; the outer margin straight, or slightly sinuous. Hindwing with the anal angle evenly rounded.

♂². Hindwing with the outer margin somewhat angled at tip of third median nervule; forewing, subcostal nervure with four branches, as in *Discophora*. Male with no patch of plush-like scales, but with a slender pouch and tuft near end of submedian nervure.

XXXVIII.—ÆMONA.

Forewing with the apex rounded, the outer margin convex, hindwing with the anal angle rounded, the outer margin regularly convex.

♂¹. Forewing, subcostal nervure with four branches, the first two anastomosed as in *Discophora*. Male with a tuft of erectile hairs at base of subcostal nervure on upperside of hindwing.

XXXIX.—THAUMANTIS.

♂¹. Forewing, subcostal nervure with three branches only, all free, the second being obliterated. Male with a tuft as in *Thaumantis*.

XL.—STICHOPTHALMA.

♂¹. Forewing, subcostal nervure with four branches, all free. Male with a tuft of hairs near base of median nervure folded upwards over the nervure.

XLI.—CLEROME.

Genus 33.—XANTHOTANIA, Westwood.

Clerome subgenus *Xanthotania*, Westwood, Trans. Ent. Soc. Lond., new series, vol. iv, p. 127 (1856).

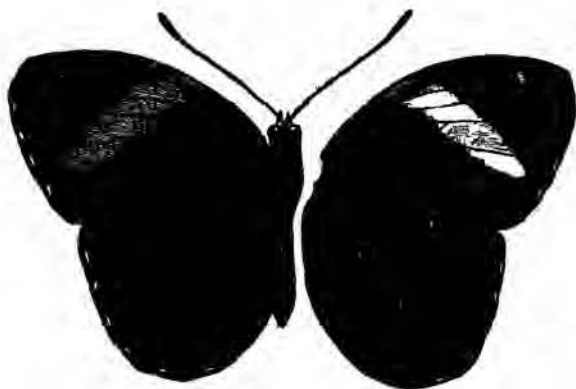
Separated from *Clerome* with the following remarks: "In the shortness and roundness of the forewing, and in the upperside being destitute of ocelli, this insect agrees with the genus *Clerome*; but differs in the broad oblique yellow fascia and subapical white spot of the forewing, as well as the more elongated form [in breadth] of the hindwing; and the insertion of the second branch of the subcostal nervure [of the forewing] at a [comparatively] short distance beyond the extremity of the discoidal cell, (opposite to the extremity of the costal nervure, which only reaches to the middle of the costa,) the third and fourth branches of the subcostal nervure of the forewing rise a moderate distance apart; the lower disco-cellular nervule of the forewing (closing the discoidal cell), although oblique, is nearly straight. The palpi are much compressed, of moderate size, thickly clothed with close appressed hairs, the terminal joint distinct, slender, acute at the tip, and raised to the level of the top of the crown of the head. The antennæ are long, gradually but slightly clavate, the tip a little curved and acute; they are brown, the outer half ferruginous. From all these characters I have no hesitation in regarding this insect as a distinct subgenus, to which I have applied the name *Xanthotania*, in allusion to the yellow fascia of the forewing." (*Westwood*, l. c.)

Xanthotania in reality bears only a superficial resemblance to *Clerome*; the following are its chief distinctive characters: **FOREWING**, subcostal nervure with all its branches free, the second originating not far beyond the end of the cell; middle disco-cellular nervure comparatively long and oblique; lower disco-cellular about twice as long as the middle one, and nearly straight, oblique. **HINDWING** with the cell closed by a very slender concave nervure joining the median nervure near the origin of its second branch; the origin of the subcostal branches and of the discoidal nervule well separated, and some distance from the base of the wing; the latter arising at the junction of the disco-cellulars. The secondary sexual characters of the **MALE** consist of a raised fold along the inner edge of the submedian nervure, scantily fringed with long hairs, and terminating rather beyond the middle in a denser tuft of erect hairs. No tufts near the base of the median or subcostal nervures, nor on the abdomen of the insect.

Mr. W. L. Distant (Rhop. Malay., p. 82), states that the cell of the hindwing has the apex entirely open, but according to Westwood's, original diagnosis it is closed, and this is also the case in all the specimens from Tenasserim which we have examined. Only a single species is known.

272. *Xanthotania busiris*, Westwood.

Clerome (*Xanthotania*) *busiris*, Westwood, Trans Ent Soc Lond., new series, vol. iv, p. 187, n. 6 (1856); *Xanthotania busiris*, Moore, Proc. Zool. Soc. Lond., 1878, p. 827, id., Distant, Rhop. Malay., p. 82, pl. v, fig. 7 (1889).



HABITAT: Upper Tenasserim, Malacca, Sumatra, Java, Borneo.

EXPANSE; ♂, 2.6 to 2.85 inches.

DESCRIPTION: **UPPERSIDE** chestnut-fusca. **Forewing** with the apical half fuscous, a straight oblique yellow fascia, and a white subapical dot. **UNDERSIDE** paler. **Hindwing** with four very wavy fuscous streaks, and eight ocelli irregular in size. The general colour of the **UPPERSIDE** is rich but dull chestnut-brown; the **hindwing** immaculate; the **forewing** with the outer half dark brown, with a moderately broad, nearly straight yellow fascia, extending from the middle of the costa nearly to the outer margin (below the middle), and with a subapical white dot. **UNDERSIDE** pale brown (without any chestnut tinge), the **hindwing** with four deeply scalloped, slender brown strigæ; the space between the second and third being the widest, enclosing eight ocelli of unequal size, the second and sixth from the costa being the largest; they are thickly powdered with grey scales, and are surrounded by a very narrow yellow ring; the space between the third and fourth strigæ is paler than the rest of the wing, and between the first and second strigæ is a short transverse dark line, being the nervule closing the discoidal cell. In the **forewing** the discoidal cell is marked in the middle with a

very strong angulated brown slender line, and between the white subapical dot and the extremity of the yellow oblique fascia are two small nearly rudimentary ocelli similar to those of the hindwing." (*Westwood, l.c.*) "The FEMALE resembles the male." (*Distant, l.c.*)

X. bustris is found in the Malay Peninsula, extending northwards as far as Upper Tenasserim, where Lamborg took it near Moolai at 3,000 to 6,000 feet altitude; and Captain C. T. Bingham also took it in the Donat range and the lower Thoungyeen forests in April. All the specimens we have seen are males.

The figure shows the upper and undersides of a male specimen in Major Marshall's collection taken in Upper Tenasserim.

Genus 34.—ZEUXIDIA, Hubner

Zeuxidia, Hubner, Samml. Ex. Schmeltz (1816 1824), id., Westwood, Gen. D. L. p. 327 (1851)

BODY very hairy HEAD moderately large, hairy; eyes large, prominent, naked; palpi elongate, compressed, erect, the third joint rising above the level of the top of the head, thickly clothed with appressed scales in front, slightly hairy at the back of the middle joint; terminal joint slender, well-defined, and rather long, antennæ rather less than half the length of the forewing, slender, the articulations rather long, distinct; the club very slender, elongate, gradually formed and slender at the tip. FOREWING large, triangular, the costa convex; the apex acute; the outer margin oblique, slightly concave, the hinder angle rounded the inner margin convex in the male. The first subcostal nervule given off before the end of the cell, about three-fourths its distance from the base, and anastomosed with the costal nervure; the second emitted before the end of the costal nervure, the third and fourth close together towards the apex; the upper disco-cellular obliquely directed outwards, the second twice as long and in a straight line with the upper portion of the lower, which is very long and slightly concave, joining the median nervure midway between the points where the second and third median nervules are given off; the median nervure continued beyond the point where the third median nervule is given off in a short outwardly curved spur not reaching the lower discoidal nervule, which spur is merged in the fold of the wing, giving the appearance of a fourth median nervule; the submedian nervure straight for a short distance from its base, then angled, and following the contour of the convex inner margin. HINDWING large, the costa convex, the apex rounded, the outer margin convex, and produced at the anal angle into a distinct narrow but not acute tail, the inner margin highly convex and channelled to receive the abdomen; the discoidal nervule almost straight in continuation of the subcostal, an incomplete lower disco-cellular nervule originating at the point on the median nervure where the third median nervule is given off, and not reaching the discoidal nervule, but becoming merged in the wing membrane which is discoloured with yellow at its termination, thus only partially closing the discoidal cell. FORELEGS of the male very slender, scarcely hairy, tarsus about half the length of the tibia, and equally slender, femur about as long as the tibia but not so slender. Of the female rather longer and more robust, tibia rather shorter than the femur, tarsus two-thirds of the length of and rather thicker than the tibia, spiny along the whole length beneath.

About eight species of the genus *Zeuxidia* are known, all from the Indo-Malayan region. The outline of the wings is very similar indeed to that of *Kallima* (*Nymphalinae*, a genus comprising the great "Oak-leaf" Butterflies of India), but the outer margin of the forewing is less convex and angled near the hinder angle, and the pattern of the underside is different; in *Kallima* the discal line extends from the apex of the forewing to the anal angle of the hindwing like the midrib of a leaf; and there are no ocelli; in *Zeuxidia* the discal line commences from the middle of the costa of the forewing, and the hindwing has two ocelli. The upperside of the males is somewhat similar in colouring to the *amythaon* group of *Amathusia*, but the hindwing has usually also a patch of bright blue. But in addition to the structural characters noted above perhaps the most remarkable features of the genus are the secondary sexual characters of the male insect. There are no lateral tufts on the abdomen as in *Amathusia phidippus*, but the hindwing bears no less than three. The submedian nervure is sunk in a fold and angled at a short distance from its base where it bears a thick tuft of long bright brown coarse hairs, and the edge of the fold above is thickly covered with finer woolly hairs; in the discoidal cell there is an oval

shining bare patch denuded of scales in the centre, on which lies a thick tuft of long brown hairs; and above the subcostal nervure before the base of its first branch is a similar but smaller tuft on a black patch in the centre of a similar patch denuded of scales.

Only a single species is certainly known to occur within our limits, where it is found in Upper Tenasserim. Another species is recorded from India, but the authority is somewhat doubtful. All the species are rare, and a single male of *Z. masoni* in Major Marshall's collection is the only specimen of the genus in the collections in this country so far as we know.

Key to the Indian Species of Zeuxidia.

A. Males. Upperside dark brown, forewing crossed by a broad band of purplish-blue or blue; hindwing, with a similar band on the outer margin.

a. The patch on the hindwing from the anal angle almost to the discoidal nervule.

273. *Z. masoni*, Upper Tenasserim.

â. The patch extending from the outer to the anal angle.

274. *Z. doubrudani*, India (?)

273. *Zeuxidia masoni*, Moore.

Z. masoni, Moore, Proc. Zool. Soc. Lond., 1878, p. 826; id., Marshall, Journ. A. S. B., vol. ii, pt. ii, p. 39, n. 4 (1882).

HABITAT: Upper Tenasserim.

EXPANSE: ♂, 4.1; ♀, 4.5 inches.

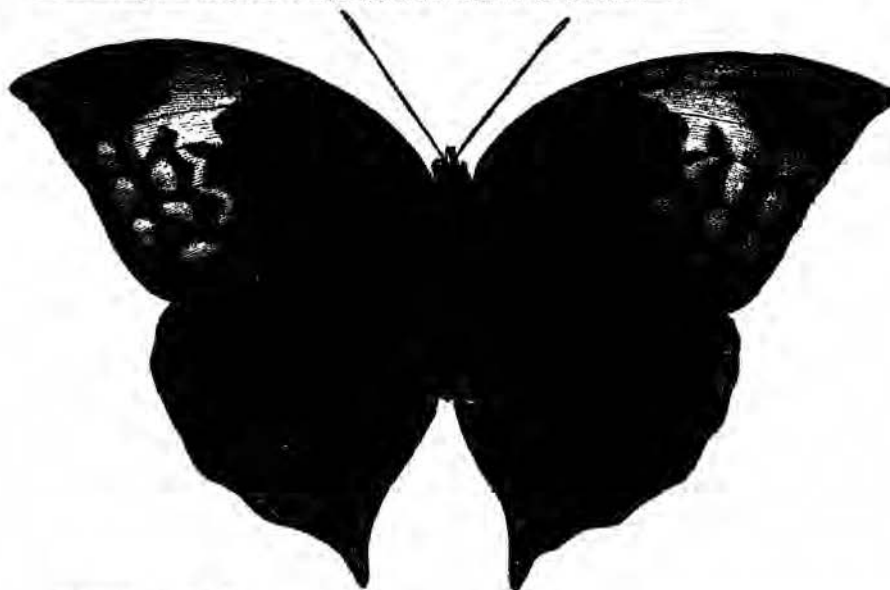
DESCRIPTION: MALE: UPPERSIDE velvety blackish-brown, paler at the margins. Forewing crossed by a purplish-blue subapical decreasing band extending from the costa just beyond the cell to the hinder angle. Hindwing with a broad purplish-blue patch from the anal margin extending on the outer border to the fold below the discoidal nervule. UNDERSIDE brown, with violet-whitish markings; the basal half of both wings darker, and defined by a dark brown median line from the middle of the costa of the forewing to the anal angle of the hindwing. Forewing with three whitish bands in the cell, and one just beyond it, the costal half beyond the median line being clouded with whitish to the apex. Hindwing with three nebulous whitish bands on the basal half, that nearest the base the broadest and most distinct; the median line edged exteriorly with whitish irroration; two moderate-sized ocelli, one between the subcostal nervules, brown, with diffused yellowish pupil, narrow yellowish iris, and outer dark brown line; the other on the lowest median interspace yellowish with eccentric brown pupil and dark outer line. Described from the male in Major Marshall's collection. FEMALE differs from *Z. amethystus*, female, in the paler colour of the wings, and in the greater breadth of the yellow oblique band, the band entire, and terminating at the middle median nervule, below which are two similarly-coloured spots; a small pale patch before the apex of the wing. Hindwing pale cinnamon-brown broadly along outer border." (Moore, l. c.)

Closely allied to *Z. amethystus** from the Malay Peninsula, Sumatra and Borneo. The female of *Z. masoni* was taken by Limborg in Upper Tenasserim at Meetan 3,000 feet altitude in April; the male was taken by Captain C. T. Bingham in the Lower Thungyeen forests in the same district at the same season. It is a very rare insect.

* *Zeuxidia amethystus*, Butler, Proc. Zool. Soc. Lond., 1865, p. 485, n. 5; idem, id., Trans. Linn. Soc., Zoology second series, vol. i, p. 538, n. 1 (1876), id., Distrikt, Rhop. Malay, p. 72, pl. vii, figs. 1, male; 2, female (1882); *Z. wallacii*, Felder, Reise Novara, Lep., vol. iii, p. 461, n. 777, pl. lxxi, fig. 3 (1866), male. HABITAT: Province Wellesley; Malacca; Borneo. EXPANSE: Male, 3.6 to 3.8; Female, 4.35 to 4.75 inches. DESCRIPTION: MALE: UPPERSIDE forewing deep brown, glossed with purple; a broad lilac band glossed with purple near the apex, extending from the anterior margin, just beyond the cell, to the third median nervule, wider above than below; outer margin pale. Hindwing, anal angle caudate; rich brown, lower portion glossed with purple; a broad lilac patch, glossed with purple, bisinuate on its inner edge, at the anal angle, extending from just below the body to the fold between the second and third median nervules; cell hirsute, hair ochreous; outer margin pale. UNDERSIDE forewing, golden-brown, dusky towards the inner margin; a narrow, irregular, oblique, deeper brown band crossing the middle of the wing; three irregular paler brown bands crossing the cell at equal distances; a pale brown spot on the anterior margin, just beyond the central band; two similar spots near the apex. Hindwing, golden brown; a deeper, oblique, narrow, irregular, brown band crossing the wing at the end of the cell, from near the end of the costal nervule to beyond the middle of the third median nervule; two indistinct, pale brown, irregular bands near the base, the inner one extending to the median nervule, the outer one to the middle of the cell; a large, oval, ochreous ocellus, pupilled with white, between the first and second subcostal nervules, and a circular ochreous ocellus pupilled with white, between the

274. *Zeuxidia doubledadi*, Westwood.

Z. doubledadi, Westwood, Gen. D. L., p. 329, n. 2, *note*, pl. III, fig. i (1851), *female*.



HABITAT : India (?)

EXPANSE : 4·25 to 4·75 inches.

DESCRIPTION : "The British Museum also contains both sexes of an allied species [to *Z. luxerii**] from India, the MALE of which is distinguished by its more acuminate *forewing*, destitute of the pale spot near the tip; the broad lilac bar of *Z. luxerii* is replaced by a much narrower and more curved blue bar; the *hindwing* has the tail much less acuminate; the lilac patch of this wing is replaced by a very broad blue fascia, which extends to the anal angle; the middle of the discoidal cell has an elongate-ovate smooth spot destitute of hairs (which may, however, have been abraded). [UNDERSIDE] the dark brown streak across both wings is curved towards the tip at its junction with the costa, and the

second and third median nervules" (*Butler*, l. c. in *Proc. Zool. Soc. Lond.*) "FEMALE; *UPPER SIDE*, both wings pale brownish. *Forewing* becoming chocolate-brown beyond the apex of the cell, and there possessing the following pale stramineous markings:—A waved fascia commencing on the costal margin a little beyond the cell, and terminating above the first median nervule, where it is outwardly followed by a small spot; beneath are six spots placed three above and three beneath the second median nervule; and near the apex there is also an indication of a pale spot. *Hindwing* with the outer marginal area more or less ochraceous, on which is a sub-marginal waved and broken dark chocolate fascia, becoming in some specimens obsolete towards the anal angle; on the inner side of this ochraceous area is an ill-defined darker apical patch or suffusion, on which are three pale ochraceous spots, two above and one beneath the discoidal nervule; there is also a similar but much fainter spot beneath the first median nervule (in one Malaccan specimen these spots are nearly obsolete); anal caudate prolongation marked with white on each side. *UNDERSIDE* generally as in the male, but the smaller ocellated spot on the hindwing in the male is absent, and the whitish suffusion more distinct. Considerable variation in depth of colouration is observable both above and beneath amongst male specimens." (*Distant*, l. c.)

* *Zeuxidia luxerii*, Hübner, *Samml. Ex. Schm.* (1816-1824); id., Westwood, *Cab. Or. Ent.*, p. 49, pl. xix, fig. 5 (1843), *neurion of forewing*. HABITAT : JAVA. EXPANSE : 3½ inches. DESCRIPTION : In the *Genera of Diurnal Lepidoptera* (p. 389) Professor Westwood records the following note : "A MALE specimen of the type of this genus, *Z. luxerii* from Java, in the British Museum has the *forewing* marked with a very broad lilac bar, extending in a somewhat curved direction from the middle of the costa to the anal angle; two outer angle of the *hindwing* marked with a broad patch of lilac, and the middle of the discoidal cell with an elongate-oval patch of brown hairs; the tail of the hindwing is also considerably acuminate. The *UNDERSIDE* is purplish-brown, with dark clouds, and with the dark streak across both wings slightly bent towards the base of the forewing, at its junction with the costa, and the ocellus on the disc of the hindwing next the costa is very much smaller than the one towards the anal angle; the extremity of the forewing is also marked with a small pale oval patch. Dr. Boisduval possesses the FEMALE of this species, the wings of which on the *UPPER SIDE* are brown, darker in the middle of the forewing, beyond which is an oblique bluish white fascia, obliterated towards the anal angle, where are three obscure fulvous spots, the hind one occupying the anal angle. The *hindwing* is brown, with an internally submedian dull fulvous margin. On the *UNDERSIDE* it agrees with the male, but is more uniform in its colours." (*Westwood*, l. c.)