

179. *Hipparchia thelephassa*, Hübner.

Eumenis thelephassa, Hübner, Samml. Ex. Schm. vol. ii, pl. lxxxv, figs. 1-4 (1816-1822); *Satyrus thelephassa*, Herrich-Schäffer, Schm. Eur. vol. i, figs. 178, 179 (1844); figs. 303, 306 (1846); *Hipparchia thelephassa*, T. Klüg, Symb. Phys., pl. xxix, figs. 1-4 (1832); *Satyrus anthelus*, Boisduval, Icones, vol. i, p. 206, pl. xli, figs. 3, 4 (1832), female; idem, id., Doubleday, Hewitson, Gen. D. L., pl. lxxv, fig. 3 (1851), female.

HABITAT: Afghanistan, Beluchistan, Persia, Syria, Russia.

EXPANSE: ♂, 2.1 to 2.3; ♀, 2.4 to 2.7 inches.

DESCRIPTION: MALE. UPPERSIDE brown, with a broad submarginal fulvous band on both wings. Forewing with the inner margin of the band much angled at the third median nervule, the outer edge lunulate and parallel with the margin, bearing an upper and lower black spot with minute white pupil; and two white spots between them. The sexual mark extends into the discoidal cell, black overlaid with brown scales. Hindwing with the fulvous band abbreviated, its outer edge lunulate and parallel with the margin, its inner edge irregularly dentate and less sharply defined; bearing a single minute black spot with white pupil on the lower median interspace and sometimes a white dot on the upper median interspace. UNDERSIDE. Forewing with the fulvous band, ocelli and white dots as on upperside, but with the middle of the disc also fulvous, extending into the cell, the costal margin broadly pale brown, mottled and streaked with whitish and dark brown. Hindwing whitish, clouded with pale brown and mottled with darker brown, the subbasal line scarcely traceable; the median rather more defined and indistinctly margined outwardly with a whitish diffused fascia, the submarginal line most distinct and defined with whitish outwardly; a minute subanal ocellus as on upperside. FEMALE as in the male, but lacking the sexual black patch in the cell; and with the inner margin of the fulvous band much more angulate.

The figure by Westwood shows the middle of the disc on the forewing fulvous on the upperside also, but none of the specimens we have examined correspond with it in this particular.

H. thelephassa has as yet only been found within our limits in the assigned districts of Beluchistan now administered by the British Government. It was taken at Chaman in May, at Gwal in May, and at Quetta in May and September, by Lieutenant-Colonel Swinhoe, and in September and October by Colonel A. M. Lang at Quetta at 5,500 feet elevation, the Hanna Valley 6,500 feet, and the Kawa Valley 8,000 feet elevation, "where it was not uncommon among boulders in the gorges of the high valleys." (Colonel Lang). At Kandahar Major Roberts notes that it is "very common at the beginning and middle of May in the nullas and on the rocky slopes at the foot of the hills, resting under the shade of rocks and stones during the heat of the day, and flying about in the early morning and evening, when it is easily captured. In June scarcely a specimen was to be found." (Proc. Zool. Soc. Lond., 1880, p. 405).

A large *Hipparchia* of this type is found commonly in Persia; it differs from *H. thelephassa* in lacking the white dots on both sides, and more notably in having the submarginal fulvous band on the forewing distinctly macular, the patches about the upper ocellus being widely separated from those about the lower ocellus by the brown ground-colour; it seems to be just intermediate between *H. semele* and *H. thelephassa*.

Hipparchia bercei, Herrich-Schäffer, is like a desert form of *H. thelephassa*, all the colours faded and washed with cinereous; but in a variety figured by Lederer in the Ann. Soc. Ent. Belg., vol. xiii, p. 26, pl. 1, fig. 3 (1869-70), female, under the name *H. bercei*, Freyer, the band is fulvous and the white spots on it are present in both wings, and it is only to be distinguished from *H. thelephassa* by the band on the forewing being restricted and not reaching either the costa or the inner margin, and divided at the upper median nervule.

Hipparchia pelopea, Klug, which is found in Persia, appears to belong to this group. Lederer figures a variety of it named *caucasica* (Wien. Ent. Monatsch., vol. viii, p. 166, pl. iii, fig. 5 (1864), male), from the Caucasus, which appears to differ from *H. thelephassa* in having the band on the forewing incomplete and macular, not extending above the lower discoidal nervule except for a single elongate spot, on which the upper ocellus is placed, and which does not extend towards the costa; on the hindwing the band is well defined, widening regularly to the first median nervule where it abruptly ends. The white dots between the ocelli of the forewing are large and prominent.

180. *Hipparchia baldva*, Moore.*Lasiommata baldva*, Moore, Proc Zool Soc, Lond., 1865, p. 499, n. 84, pl. xxx, fig. 4, male.

HABITAT: Spiti and Thibet.

EXPANSE: 1·87 to 2·5 inches.

DESCRIPTION: "MALE UPPERSIDE: Forewing fuliginous grey. Hindwing ashy grey; both wings with a broad, irregularly margined, discal ferruginous band, which has on the forewing an upper and a lower blackish spot, on the hindwing a small spot at its lower end. FEMALE, paler. The forewing with the spots on the discal band larger, there being also a third intermediate smaller spot; the spot on the hindwing with a white pupil. UNDERSIDE grey, of the FEMALE greyish white, with numerous short blackish s. nœ. Forewing with the disc pale ferruginous, the margins of the band (as seen from above), defined by irregular black lines; in the MALE with a single, in the FEMALE with two black spots, the apical with white pupil and yellow iris; the black dot on the hindwing also with white pupil and yellow iris. Cilia silvery grey. Allied to *H. thelephassa*" (Moore, l. c.)

The MALE of *H. baldva* may be readily distinguished from that sex of *H. thelephassa* by the sexual mark, which in *H. baldva* is concolorous with the wing, extending broadly along the median nervure chiefly outside the cell, but inconspicuous. Further in *H. baldva* the inner margin of the fulvous band on the forewing is almost straight, and the spots between the ocelli are either wanting altogether or, if present, are black, not white; on the UNDERSIDE of the hindwing, the transverse irregular lines are far more distinct in *H. baldva* than in *H. thelephassa*; the FEMALE of *H. baldva* has the inner margin of the fulvous band almost as angulate as in *H. thelephassa*, but it lacks the white spots on both surfaces, and has the irregular lines of the hindwing on the UNDERSIDE far more prominent.

H. baldva is apparently a very local insect; it has never been taken so far as we know, except by Colonel Lang, from whose specimens the original description was taken; the specimens in Colonel Lang's collection are labelled "Thibet, 10,000 feet, taken between Shipkee and Broopcha in July," and the following note is recorded:—"On the bare, brown, stony mountain-slopes of Spiti, Upper Kunawar, Thibet, this species seems to delight in the hot weather of June and July." In Ladak it appears to be replaced by the closely allied *H. lehana*.

181. *Hipparchia lehana*, Moore. (PLATE XVI, FIG 489)*H. lehana*, Moore, Ann and Mag of Nat Hist, fifth series, vol 1, p. 227 (1878), idem, id., Second Yarkund Mission, Lep, p. 1, pl. 1, fig. 4 (1879), male.

HABITAT: Leh (September 6th, 1873); Khabu (13,000 feet), Ladak.

EXPANSE: ♂, 2·00 inches; ♀, 2·25 inches.

DESCRIPTION: "Allied to *H. baldva*, Moore, from Upper Kunawar. UPPERSIDE paler in colour, the discal transverse luteous band is broader on both wings, and its inner border in the MALE is inwardly oblique. BOTH SEXES above and beneath are without the small ocellus on the band above the anal angle. UNDERSIDE also very much paler, and the transverse sinuous lines wider apart" (Moore, l. c., in Ann. and Mag.)

Mr. de Nicéville took one male and two females of this species at Chanagund, Ladak, on June 30th. The male differs from the type male of *H. lehana* in being larger (2·55 as against 2·10 inches), and in having the inner edge of the submarginal fulvous band on the upperside of the forewing more distinctly angled inwardly above the third median nervule. On the hindwing, there is a minute black dot in the lower median interspace as in *H. baldva*, but smaller. The sexual streak is inconspicuous. The females are also larger, (2·90 as against 2·65 inches), otherwise they agree with the female type specimen. The angulation of the inner margin of the fulvous band on the forewing of the male sufficiently distinguishes it from *H. baldva*.

The figure shows the upper and undersides of a female in Mr. de Nicéville's collection; taken at Chanagund, Ladak.

182. *Hipparchia digna*, Marshall.*H. digna*, Marshall, Journ. A. S. B., vol. 1, pt. 11, p. 67 (1882).

HABITAT: N.-W. Himalayas.

EXPANSE: 2.45 inches.

DESCRIPTION: FEMALE UPSIDE, rather dark brown, with a broad fulvous submarginal band outwardly defined with dark lunules, and bearing on the forewing a single apical oval black spot scarcely perceptibly pupilled, on the hindwing unmarked. The band is regular and well-defined throughout, slightly angulate on its inner edge on both wings, and parallel to the margin, but inversely scalloped on the outer edge, it is well removed from the margin, leaving a much broader brown border than in any other Indian *Hipparchia*. UNDERSIDE: Forewing with the fulvous band as on upperside, but ochraceous at the costal and inner margins; the black subapical spot, but distinctly pupilled, the middle area of the basal half also fulvous merging into the submarginal band, a dark submarginal dentate line defining the band outwardly, the inner margin broadly dark brown, except where crossed by the band, the outer and costal margins broadly pale brownish mottled with darker brown; and the latter with numerous irregular dark brown strigæ, extending into the cell. Hindwing pale brownish white, clouded with a darker shade, and mottled throughout with very dark brown strigæ; a dark brown dentate line corresponding to the outer margin of the band of the upperside, another corresponding with the inner edge, the space between them being inwardly broadly whitish, outwardly clouded with brown; a subbasal dark line, between which and the discal line the ground-colour is brown, the base of the wing being rather paler brown with several well-defined strigæ.

Two specimens, both females, were taken by Major J. Biddulph on the Shandur plateau in Northern Kashmir.

183 *Hipparchia huebneri*, Felder.*Satyrus huebneri*, Felder, Reise Novara, Lep., vol. 11, p. 494, n. 855 pl. lxx, figs. 8, 9 (1866), female.

HABITAT: Lahoul; Shigri, Spit; Dishungdeo; Gilgit, N.-W. Himalayas.

EXPANSE: 1.9 to 2.1 inches.

DESCRIPTION: "MALE. UPSIDE darker than in *Satyrus agave*, Esper [= *Satyrus alcyon*,* Fabricius, nec Wien. Verz.], the fascia much deeper fulvous, outwardly acutely dentate, more distant from the margin; in the forewing inwardly rather diffused, not at all divided by fuscous veins, and distinctly marked with blind spots, in the hindwing shorter, not extending beyond the second subcostal nervule, without an ocellus. UNDERSIDE also darker than in *S. agave*. Forewing with the entire disc fulvescent, darker in the middle, divided by a single swarthy disco-cellular litura, the ocelli smaller, the upper one broadly and diffusely circled with ochraceous, the submarginal striga more drawn back anteriorly than as in *Satyrus geyeri*†. Hindwing with all the nervules white, the streaks as in *S. geyeri*, but

* *Satyrus alcyon*, Fabricius. HABITAT Russia. DESCRIPTION: Wings, dentate, upperside fuscous, with a yellow fascia margined with black, not at all sinuate on the forewing, with two ocelli on both sides. UNDERSIDE Hindwing marbled with cinereous and fuscous, no fascia. *Papilio S. alcyon*. Wings dentate fuscous, banded with yellow, forewing with two ocelli on both sides. Hindwing marbled on the underside (Fabricius, Mant. Ins. vol. 11, p. 38, n. 399 (1787), idem, id., Ent. Syst., vol. 11, pt. 1, p. 231, n. 724 (1793)). Closely allied to *S. semele*, but distinguished from it in that the yellow band of the upperside of the wings is better detached from the ground-colour and is bordered with black that it is straight, and almost continuous on the forewing, that it has no spot, at least well defined, on the hindwing, that the underside of the latter is destitute of the angulate white band, that the underside of the former, with the exception of the margins, which are brown, is everywhere of a pale yellow, and moreover cut transversely by undulate black lines. It inhabits the very elevated places in the southern parts of Russia. It must not be confounded with that variety of *hermione* of which several authors have made a separate species under the name of *alcyon*." (Godart, Enc. Méth., vol. 12, p. 517, n. 112 (1819)).

† *Satyrus geyeri*, Herrich-Schäffer, Schmett. Eur., vol. 1, figs. 301, 302 (1846-47). HABITAT: Asia Minor. EXPANSE: 2 inches. DESCRIPTION: MALE. UPSIDE brown, with a well defined paler submarginal band bearing two faint ocelli, and with the other markings of the underside showing through by transparency. UNDERSIDE: Forewing pale ochraceous, the outer margin brown, inwardly defined with a series of dark convex lunules, a subapical and a lower black spot, each with a minute white pupil, a prominent but interrupted dark line defining the inner edge of the pale submarginal fascia, a dark streak on the disco-cellulars, and another in the cell, the costa and the cell being mottled with fuscous. Hindwing brown, the cilia and all the nervules white; a highly dentate submarginal line, another median-irregular, outwardly broadly defined with white mottled with brown, another basal less irregular, and one on the disco-cellulars dark brown, the whole wing faintly and sparingly irrorated with dark specks.

much darker and more slender, the basal streak less flexuous forming a right angle, the discal streak not at all sloping hindwards, the submarginal streak more receding from the margin, acutely drawn back, outwardly defined with hoary white; no ocellular dot. FEMALE: UPPERSIDE with the fulvous fascia diffused inwardly in the forewing, and in the hindwing extending to the first subcostal nervule." (Felder, l. c.)

The above description being in comparison with species not occurring in India, is difficult to follow. The following description is taken from the plate:—

FEMALE. UPPERSIDE brown, the fulvous fascia sharply defined both inwardly and outwardly on both wings by dark lunulate lines, and with ochreous patches on it at the costal and inner margins of the forewing, and at the costal margin of the hindwing. The forewing with a black subapical spot, and another on the lower median interspace both on the fulvous band; the hindwing with no spots. UNDERSIDE. Forewing with the outer margin pale brown, and the costal margin narrowly so; the rest of the wing fulvous, the outer dark lunulate line defining the fulvous, and the two black spots as on upperside, two short brown streaks across the cell and two beyond it. Hindwing with the basal half pale brown, the outer half greyish; the extreme margin dark brown; a dark brown highly dentate submarginal line inwardly suffused with brown; another almost equally dentate defining the pale brown basal half, a subbasal dark, somewhat dentate line; and an incomplete basal line with a spot beyond it in the cell, dark brown; the nervules white. Two specimens both females, taken by Major J. Biddulph at Gilgit in August, and now in Major Marshall's collection, are the only specimens we have seen; they differ from the plate, but correspond with the description, in that the fulvous fascia is inwardly diffused, much more so in one specimen than in the other, and showing a close approach to the following species *H. cadesia*.

Hipparchia geyeri is found in the Caucasus and in the mountains of Ararat. It is allied to *H. hübneri*, but has the band on the upperside brown not fulvous and almost obsolete; on the underside the forewing is paler and duller ochreous, and all the dark markings are very prominent; the hindwing also differs in having the two dark median well defined lines. *Hipparchia geyeri*, Esper, is also very similar to *H. hübneri*; the band on the upperside is fulvous margined with dark brown, the underside being almost exactly as in *H. geyeri*, but with less white on the hindwing.

Hipparchia regeli, Alphéraky, has lately been described from Kuldja (Hor. Soc. Ent. Ross., vol. xvi, p. 419, n. 91, pl. xv, fig. 23 (1881)). EXPANSE: 1·7 inches. UPPERSIDE: "Forewing pale olivaceous-fuscous (or brownish), the fascia smoky-white or yellowish-white, bearing two black ocelli with white pupils (very rarely blind). Hindwing with the fascia narrower, outwardly dentate, inwardly inversely dentate and everywhere clearly defined. UNDERSIDE of the hindwing with the nervures white, the disc greyish (fuscous covered with obscure markings), irregularly terminated, defined with whitish, and an interrupted series of acutely dentate fuscous marks before the margin. Cilia everywhere white alternated with grey." It is very closely allied to *H. hübneri*, but has the fulvous band narrower and everywhere better defined.

184. *Hipparchia cadesia*, Moore.

H. cadesia, Moore, Proc. Zool. Soc. Lond., 1874, p. 365, pl. lxi, fig. 7, male.

HABITAT: Kashmir; Boorzil Valley towards Stakpila Pass, 11,000 feet; Leh, Ladak.

EXPANSE: 1·58 to 2·2 inches.

DESCRIPTION: "MALE. UPPERSIDE bright ferruginous; exterior marginal line blackish, Cilia yellowish alternated with brown. Forewing with the base, costal, and exterior border pale brown; a subapical pale-bordered black spot with a white central dot; subcostal nervure and its branches blackish, terminating in a transverse sinuous submarginal line. Hindwing with the base, abdominal and outer border brown, the nervures being ferruginous; a submarginal series of blackish lunules. UNDERSIDE: forewing paler ferruginous, the costal and outer borders being fawn-colour; a few transverse brown strigæ within the cell; nervures below the apex terminating in a pale streak. Hindwing ferruginous white, numerously covered with short

blackish strigæ, which are thickest at the base; nervures prominently whitish; a broad ~~creamy~~ transverse median brown band with irregular black borders, and a broad submarginal brown band with black outer dentate lunules; outer margin and base of wings suffused with brown. Body and legs brown. Antennæ yellow, tip ferruginous. Allied to *H. huebneri*, Felder.⁴ (*Moore*, 1 c)

We have seen only a single specimen of *H. cadesia*, a female taken at Leh in Ladak by the late Dr. Ferdinand Stoliczka, Ph D., on the 8th September, 1873, and now in the Indian Museum, Calcutta. In Moore's figure of the species the underside of the hindwing has the transverse fasciæ very slightly dentate, but in the specimen here these lines are as highly dentate as in *H. huebneri*. No sexual mark is shewn in the figure or mentioned in the description.

The FEMALE differs from the male in having a small black spot on the first median interspace on both sides of the forewing; it is very closely allied indeed to the female of *H. huebneri*, the only noteworthy features being the complete suffusion of the basal area of the forewing with fulvous, and the very small size of the black spots in *H. cadesia*. Both these characters are variable in *H. huebneri*; and while so far as the types are concerned, there is no difficulty in separating them; it is probable that when more is known about these rare species, it will be found that the line of separation between them cannot be maintained.

The remaining species are much blacker in tone, with the markings on the upperside typically creamy-white, but varieties of several of the species are found in which the markings are more or less deeply tinged with fulvous.

185 *Hipparchia shandura*, Marshall

H. shandura, Marshall, Journ A S B, vol II, pt II, p 38, pl IV, fig 3 (1882), female.

HABITAT: Northern Kashmir.

EXpanse ♀, 2.4 inches.

DESCRIPTION: UPPERSIDE, both wings dull black, with creamy-white markings. Forewing with the costal margin streaked and mottled with grey and black, a large blotch of creamy-white in the discoidal cell, filling it completely from the base to near the extremity where it ends abruptly, and a discal series of long, mutual creamy white streaks, consisting of a short streak above the subcostal nervure, a very long one below it bearing a round black spot in the middle, a very short narrow streak between the discoidal nervules, a larger streak below the third median nervule, a larger one still below the second median nervule divided transversely by a large blackish spot, a shorter streak filling the whole width between the first median nervule and submedian nervure, and bearing a blackish spot near its outer upper end, and a short streak below the submedian nervure. Cilia long, white, broadly interrupted with black at the ends of the nervules. Hindwing with a broad discal transverse band of creamy-white longitudinal streaks completely coalescent, widest at the middle, where it extends half way into the discoidal cell, and narrowest at the margins, especially at the costal margin. Cilia long, white, scarcely perceptibly interrupted with black. UNDERSIDE. Forewing with the costal margin and apex whitish, finely mottled with brown: the cell white, mottled with brown at its upper edge, and with a blackish bar near the extremity; the discal series of streaks as above, but all larger, completely coalescing, and sharply defined with dark brown internally and externally, except at the apex, where they merge into the mottled ground, the two black spots of the upperside reappearing as black ocelli with white pupils. Hindwing white mottled with brown, the mottlings deepening into three irregular dark brown mottled transverse bands darkest at their outer edges, one submarginal, one near the base of the cell, and one between these two.

Allied to *H. briseis*, Linnæus, from Northern and Western Asia, but smaller and notably differing in having a large creamy-white patch in the discoidal cell of the forewing completely filling the cell except at its extremity; and in this feature approximating to the species of *Melanargia* (*galathea*, *lachesis*, *psyche*, *clotho*, &c.), in colouring.

A single specimen, which is now in the Indian Museum, Calcutta, was taken by Major J. Biddulph on the Shandur plateau in Northern Kashmir.

Hipparchia briseis, Linnæus, is found in the Caucasus and near Kuldja, and also in Turkestan. It is a smaller insect; the upperside is almost as in *H. shandura*, but without the creamy-white patch in the cell of the forewing; on the underside the forewing is very similar in markings, but the dark bar across the cell is much wider; the hindwing has the nervures concolorous with the ground, not white as in *H. shandura*, and is of a yellowish-brown tinge, clouded with darker brown, mottled with deep brown throughout in the female, and with a dark submarginal line and two dark patches near the base in the male. There is a large variety of this species found in Persia which is probably the variety referred to by Alphéraky in his paper on the Lepidoptera of Kuldja and the surrounding mountains (Hor. Soc. Ent. Ross, vol. xvi, p. 418 (1881). At first sight it appears very distinct on the underside, which is pale ochreous brown, almost devoid of mottlings, and the hindwing without any markings whatever in the female, except traces of a broad nebulous paler median band, but the whole of the markings, so far as they appear at all, are exactly as in typical *H. briseis*, and the pale underside is precisely the variation which would be expected from the arid nature of the country in which this variety is found.

Hipparchia heutenreichi, Lederer (Verh. Zool. Bot. Ges., vol. iii, p. 359, pl. i, fig. 2 (1853), also occurs in Turkestan and in the Altai mountains. It is placed by Kirby and Erschoff between *H. briseis* and *H. anthe*, but neither figure nor description is available in this country.

186. *Hipparchia anthe*, Ochsenheimer.

Papilio anthe, Ochsenheimer, Schmett. Eur., vol. i, p. 169, n. a (1807), *Papilio persephone*, Hübner, Eur. Schmett., vol. i, figs. 589-590 (1809-1807), figs. 710-711 (1825?), *Satyrus anthe*, Boisduval, Icones, p. 200, pl. xl, figs. 3, 4 (1832), female, *Hipparchia persephone*, Butler, Cat. Lep. B. M., *Satyrinae*, p. 55, n. 16 (1868), id., Kirby, Syn. Cat. D. L., p. 85, n. 29 (1871).

HABITAT: South Russia, Persia, Afghanistan.

EXpanse: ♀, 2.8 inches.

DESCRIPTION: UPPERSIDE blackish brown, slightly greyish towards the base, with a greenish reflection in certain lights, with beyond the middle a whitish band almost as in *H. briseis*. Forewing with the band interrupted, formed of elongated unequal quadrangular spots, the one nearest the apex the longest, cut in two by a black spot without a pupil, and recurved towards the costa at its inner extremity, where it is divided by the black nervules; the second irregular, narrow, just above the second median nervule; the third placed in the lower median interspace, and also cut in two by a large rather oval black spot; the fourth and fifth short; all the last four spots only separated by the dark nervules. Hindwing with the fascia broad and continuous from near the costa to the lowest median nervule, the edges irregular, the inner sharply defined, the outer diffused, a small black spot just beyond the band in the lower median interspace. UNDERSIDE: forewing yellowish, greyish along the costa and outer margin, and striated with dark brown; a dark stripe on the disco-cellular nervules, a dark band across the cell beyond the middle, and two indistinct lines nearer the base, and several scattered dark spots, the whitish macular band as on the upperside, but more dingy and inwardly sharply defined with dark brown; the black spots as on upperside but larger and oval, the inter-median interspace dark brown throughout except where cut by the whitish band; a sinuous dark brown submarginal line; the cilia grey, spotted with black at the tips of the nervules. Hindwing paler brown, striated with dark brown; all the nervures white; a highly irregular discal line of dark brown lunules and sagittate marks, beyond which is a greyish fascia gradually shading into brown, which deepens outwardly till it is again defined by a dark irregular line, beyond which is a submarginal grey fascia shading into brown towards the margin; the margin itself dark brown, inwardly edged with grey; a short whitish bar and two dark patches in the cell. Cilia as on forewing.

H. anthe, as figured by Boisduval, differs from *H. shandura* on the UPPERSIDE in having no whitish patch in the cell, the black spots on the fascia much larger, especially the upper one, and with no trace of white pupils, the black spot below the lower median nervule, and the whitish streak between the discoidal nervules wanting; on the *hindwing* by the whitish fascia being sharply defined inwardly, and not extending into the cell. On the UNDERSIDE by the *forewing* being tinged with yellow, with no whitish patch in the cell, the black spots larger and blind; and on the *hindwing* by having the discal dark brown line continuous, whereas in *H. shandura* it is interrupted by the greyish white band extending back into the cell.

From *H. briseis* it differs in the style of the whitish macular band on the UPPERSIDE, for in *H. briseis* the upper whitish streak of the *forewing* does not curve up to the costa inwardly, the streak between the discoidal nervules is prominent, and the black spots are small, equal, rounded, and distinctly pupilled, while on the *hindwing* the band is wider, extending into the cell, and diffused inwardly as well as outwardly. On the UNDERSIDE *H. briseis* has the *forewing* less decidedly tinged with yellow, and the black spots are small, round, and distinctly pupilled; the *hindwing* is darker and the markings clouded and indistinct, with in the male large dark brown patches.

In some notes* on a small collection of Lepidoptera from the neighbourhood of Kandahar taken by Colonel Swinhoe, Mr Butler identifies a specimen as "*Hipparchia anthe* ♀, var ? Boeb. Taken on the 14th May at Chumun. It differs somewhat from European examples on the underside; but it would not be safe to regard it as distinct until more examples have been seen." No description of this specimen is given, and we have no other record of its capture on the confines of India.

According to Boisduval (Icones, vol. 1, p. 201 (1832), *Hipparchia anthe*, Ochsenheimer, "was discovered by Boeber, and some entomologists still call it *H. anthe*, Boeber (*anthe boeberi*)". None of the standard catalogues or works on Lepidoptera, so far as we can trace, admit "*anthe*, Boeber," and we are not aware on what grounds Mr Butler has so recently resuscitated the term. It is indeed doubtful whether the name *anthe* should stand at all. *H. anthe*, Ochsenheimer, is identical with *H. persephone*, Hubner, and Mr Butler records it as *H. persephone*, and remarks "Ochsenheimer has substituted the name *anthe* for *persephone* on the ground of this name having been previously used by Bal, eius, such a name, however, does not seem to exist amongst the *Satyrinae*" (Cat. Lep. B. M. *Satyrinae*, p. 55 (1868)); but as M. Erschoff, in his Lepidoptera of Turkestan, dated 1874, rejects the name *persephone* and retains *anthe*, we have adopted his conclusion.

Hipparchia hanifa (*Satyrus hanifa*, Herrich Schaffer, Schmett. Eur., vol. 1, figs. 477, 478 (1850?)) is a variety of *H. anthe*, and identical apparently with *H. anthe*, var. *caucasica*, *hanifa* (sic), Nordmann (Bull. Mosc., vol. xxiv, pt. 1, p. 405, n. 3, pl. ix, figs. 1-3 (1851)), it was described in Nordmann's Fauna Taurico-Caucasica, and is included in Erschoff's Lepidoptera of Turkestan. It differs from *H. anthe*, female, on the UPPERSIDE only in having the black spot rounded, and rather smaller, and the white fascia tinged with fulvous in the male, deep fulvous throughout in the female. On the UNDERSIDE also the *forewing* has the black spots smaller, the whole disc yellow and the macular fascia merged in the yellow ground, and not at all defined; the *hindwing* has the ground-colour finely mottled with dark brown instead of being striated, the whitish fasciæ are more prominent, and the nervules are not prominently irrorated with white. This variety also occurs in Persia, and according to Butler it is "very like *H. pelopea* on the upperside, but without the white intermacular spots". (Cat. Lep. B. M., *Satyrinae* p. 55 (1868).)

Another variety, *H. anthe*, var. *enervata*, Alpheraky, and an aberration named *analoga*, Alpheraky, have been recently described (Hor. Soc. Ent. Ross., vol. xvi, p. 418, n. 89 (1881)) with the following remarks:—" *H. anthe*, var. *enervata*. A little smaller; UNDERSIDE with

* Ann. and Mag. of Nat. Hist., fifth series, vol. 1x, p. 266 (1882).

the nervures of the hindwing not whitish. *H. anthe*, ab. *analoga*. UPPERSIDE with the fasciæ golden yellow; UNDERSIDE as in var. *enervata*. The variety *enervata* is always a little smaller than the true *H. anthe* of South-Eastern Russia. The fasciæ are never of a pure white as in the latter; if indeed on the upperside the bands are white (which is rare), they are always more or less ochraceous on the underside, so also is always part of the disc of the forewing on the underside. But the variety *enervata* is above all characterised by the hindwing, which is not veined with white or whitish. The aberration *analoga* corresponds absolutely to the variety *hanifu*, Nordmann, by the orange-yellow colour of the bands, and with *enervata*, by the underside of the hindwings. The specimens taken in August appear to me smaller but not otherwise distinct from those taken in May. It occurs between 2,000 and 3,500 feet altitude. The *H. anthe* of the Altai and of Ferganah according to Soudinger, as well as all those of Turkestan according to Erschoff, belong to my variety *enervata*. (Alphéak, l. c.)

Hipparchia kaufmanni, Erschoff, (Lej. Turk., p. 19, n. 60, pl. 1, fig. 14 (1874), female) from Turkestan is a very distinct species, to judge from the figure; the upperside is brown, the hindwing unmarked, the forewing bearing a small black subapical spot on a white elongate streak which joins a small whitish streak from the costa; a small black spot on the upper median interspace and a large one on the lower, both narrowly ringed with whitish; the underside almost uniform ochreous, the hindwing with indistinct median and submarginal dusky lines; forewing with the black subapical spot, but no pale streak; and the two median spots ringed as on the upperside, and placed on a diffused dark discal patch.

Hipparchia phedra, Linnæus, with which *H. dryas*, Scopoli, is closely allied, if not identical, is also found over the same area; it is very distinct from all the foregoing, the upperside being uniform brown with no trace of a submarginal band, but with two black spots bearing large bluish-silvery pupils; the underside being also dark brown throughout, with the ocelli of the upperside, a darker submarginal band on both wings, and an indistinct median band on the hindwing.

Hipparchia circe, Fabricius, [= *Hipparchia proserpina*, Wiener Verzeichniss] which most nearly resembles the *Aulocera* genus in colouration, has been found in the Caucasus; it very closely resembles *A. padma*, but on the underside the white band is broader and better defined on the forewing; and there are clouded white patches in the cell of the forewing and a broad irregular white streak from the middle of the costa on the hindwing extending across the cell. A variety, *H. virbius*, is recorded from the Caucasus.

Hipparchia hermiou, Linnæus, also found in Syria and the Caucasus, is a browner insect almost equally large, but with no white band on the upperside, it being replaced by an indistinct, but uniform, paler brown band. On the underside the band is pale yellowish brown on the forewing, whitish on the hindwing inwardly, and clouded with brown outwardly; the rest of the wing rather dark brown, mottled and freckled with very dark brown; a lunulate dark submarginal line, a dark median line defining the band, and a very irregular dark subbasal line.

The foregoing descriptions will suffice for the identification of all the *Hipparchias* as yet known to occur within our limits; but as shown above numerous species and varieties of this genus are found in the Caucasus, Turkestan and the neighbourhood of Kuldja, and since our own frontier and the intervening regions have been so little explored, it is difficult to predict which of the numerous forms are likely to occur on further research. We have included brief descriptions of all of these so far as our material is sufficient for this, but unfortunately it is incomplete. The species of this genus are not only numerous but are so variable and withal often so closely allied, that, unless the material is complete, conclusive identification is almost impossible.

The genus *Melanargia*, Meigen, which is closely allied to *Hipparchia*, having the eyes naked, but with the median nervure scarcely perceptibly swollen at the base, and with no secondary sexual characters in the male, does not extend to India so far as is yet known. All the species are white with black markings, and the type is the "marbled white" of England, *M. galathea*, Linnæus. One species at least is found in Persia, and a female in

the Indian Museum, Calcutta, only differs from the figure of that sex of *M. herta*, Dalman, in Boisduval's Icones, vol. i, pl. xxviii, fig. 3 (1832) in the area of the cell on the upper-side of the forewing beyond the transverse bar being clouded with fuscous; the basal area below the cell also more thickly irrorated with fuscous than in the specimen figured by Boisduval. On the hindwing the cell is whitish for the basal two-thirds. A detailed description of this specimen is appended for reference.* Numerous other species of *Melanargia* are recorded from the Caucasus and the adjoining regions.

Genus 18.—AULOCEERÆ, Butler. (PLATE XVI).

Aulocera, Butler, Ent Month Mag, vol iv, p. 121 (1867).

"Very closely allied to *Hipparchia*; wings large, black, with a white band; the *cilia* broad, white, variegated with black. BODY woolly. *Eyes* naked. *Palpi* as in *Hipparchia*. *Antennæ* with a gradually formed club, with a slightly hollowed median longitudinal streak on the underside. NERVATION of the wings as in *Hipparchia*, but the nervures of the forewing less tumid at the base; and in the hindwing the discoidal cell is more entire, and the costa more convex. It chiefly differs from *Hipparchia* in the form of the antennæ, the character of the markings, and the longer cilia to the wings; the arrangement of the nervures is very similar in both genera." (Butler, l. c.)

This genus is exclusively Indian, and, with one doubtful exception, is confined to the temperate and higher elevations in the Himalayas. The doubtful exception is the variety *scylla* of *A. brahminus*, which is described from "near Sylhet," but this locality cannot be accepted without further evidence. *Aulocera* is very closely allied to *Hipparchia*, but the very slight dilation of the base of the nervures of the forewing, and the style of colouration, mark it as a group sufficiently distinct for generic separation.

The sexual streak on the forewing of the male insect is variable, and owing to the dark colour, and density of the clothing of the wing, is often very difficult to trace. In one species (*A. padma*) the scales of the sexual mark have a slight sheen, which shows the position clearly in certain lights; in other species it is only to be traced by the greater opaqueness of the wing, and it differs in intensity in different specimens; its position is between the median nervure and the white transverse fascia, and it extends from the middle of the interspace below the submedian nervure to the interspace below the upper discoidal nervure.

Key to the species of Aulocera.

- A. Upperside nearly black, with a prominent whitish transverse fascia across both wings.
 - a. Forewing triangular, the outer margin straight; the whitish fascia broad on both wings.
 - a¹. Of large size, the whitish fascia reaching the inner margin of the hindwing. Underside with the basal area black with greyish undulations.
 - 187. *A. PADMA*, Himalayas
 - b¹. Of smaller size; the whitish fascia not reaching the inner margin of the hindwing. Underside with the basal area greenish bronze, irrorated with grey on the abdominal margin of the hindwing.
 - 188. *A. SWAHA*, Himalayas.
 - B. Forewing more rounded, the outer margin convex.
 - a¹. With the median fascia very narrow. Of small size. Underside with the basal area fuscous, irrorated with ochreous.
 - 189. *A. BRAHMINUS*, Himalayas.
 - A. veranga*, N.-W. Himalayas.
 - A. scylla*, (?) Sylhet.
 - B¹. The median fascia very broad. Underside ochreous, with narrow dark undulations.
 - 190. *A. SARASWATI*, Himalayas.

* FEMALE: UPPERSIDE fuscous; a large whitish patch in the cell of each wing, a broad whitish band from the second median nervule of forewing continued across the hindwing, covering the whole abdominal margin, and uniting with the patch in the cell. Forewing with an irregular discal macular band, an interrupted subapical band beyond it, and a marginal series of large spots all whitish. Hindwing with a similar series of large whitish spots almost coalescent along the margin. Underside tinged with ochreous, the fuscous obsolescent, except on the disc of the forewing. Hindwing with broad irregular very pale and indistinct submarginal band and another submedian; no trace of ocelli. Expanse, 2.55 inches.

The species of *Aulocera* are common where found at all; and they seem more fond of sunshine than is usual in this subfamily; one species frequents the sunny paths and glades in oak and rhododendron forests; another is found everywhere at suitable elevations; the third generally frequents the grassy slopes above the forests; and the fourth the grassy slopes and scrub jungle at lower elevations; all of them are fond of settling on paths or rocks, where they rest with their wings closed over their backs. Seven species have been described by different authors, but we are unable to admit more than four of these as really distinct. Among the older described species some confusion in synonymy has occurred, owing to Blanchard describing and figuring the same sex of two species as the opposite sexes of one species.

187 *Aulocera padma*, Kollar.

Satyris padma, Kollar in Hügel's Kaschmir, vol. iv, pt. ii, p. 445, n. 3, pl. xv, figs 1, 2 (1848), female; *Satyris avatara*, Moore, Horsfield and Moore, Cat. Lep. E. I. C., vol. 1, p. 229, n. 481 (1857), male; *Aulocera padma et avatara*, Butler, Cat. Lep. B. M., *Satyridæ*, p. 49, n. 3, and p. 50, n. 4 (1868), id. Lang, Ent. Month. Mag., vol. iv, p. 246 (1868).

HABITAT: Himalayas.

EXPANSE: ♂, 3.1 to 3.3; ♀, 3.5 to 3.7 inches.

DESCRIPTION: FEMALE: "UPPERSIDE obscure fuscous, with a common whitish fascia; macular in the forewing, and bifurcate at the apex. UNDERSIDE fuscous, marbled with grey and whitish, a black ocellus on the forewing pupilled with white, the fascia broader in the forewing, narrow in the hindwing, the clia spotted with whitish and fuscous" (Kollar, l. c.) MALE (*A. avatara*, Moore) "Differs from *A. padma* [the female] in having the transverse maculated band much narrower, and there being no spots running obliquely to the costal margin. It is less in size than *A. padma* [the female] but larger than *A. swaha* and *A. saraswati*." (Moore, l. c.)

A. padma is the largest species of the genus, and is distinguished, in both sexes, by the very black ground-colour of the underside of the hindwing. The MALE is further distinguished by the complete absence of the inner subcostal white spots on the upperside of the forewing, a character which is approached in some specimens of the very distinct *A. saraswati*, but in no other species; also by the sexual mark on the forewing being comparatively prominent. The FEMALE has the outer margin of the white fascia indistinct and often much extended by suffusion into the black ground-colour beyond, especially on the underside. It differs from the male in its larger size; and in having considerably more white on the underside; the whitish undulations covering the whole basal area of the hindwing instead of being prominent only on the abdominal margin, the outer half of the wing also is white, undulated irregularly with various shades of brown, least densely towards the costal margin.

A. avatara has hitherto been accepted as a distinct species, and even now some authorities hold to this view; but notwithstanding that *A. avatara* is common over a wide range all the specimens are males so far as has yet been ascertained, and not a single male specimen of the *A. padma* type can be found. It is true that Mr. Moore when describing *A. avatara* in the Cat. Lep. E. I. C., recorded the single specimen of *A. padma* which the Museum contained, and by which he wrote his comparative description of *A. avatara*, as a male, but that identical specimen is now in the Indian Museum, Calcutta, and notwithstanding that the abdomen and forelegs are missing, the outline of the wings, the white character of the markings, especially on the underside, and complete absence of the sexual mark leave no room for doubt that the specimen is really a female, and that the original discrimination of its sex was erroneous, and so far as the evidence at present goes, the conclusion that the two are opposite sexes of the same species is irresistible.

In 1868, Colonel Lang wrote, "*A. padma* and *A. avatara* I have always found in company, and they have appeared to me as female and male respectively of the same species. They frequent quite different ground to *A. swaha* and *A. saraswati*, and appear at a different season; flying in May and June on the borders of oak and rhododendron forests at the summits of ranges of from 8,000 feet to 10,000 feet altitude. A second brood appears in July

in the same localities. They fly with much bolder Nymphalidian flight than their tamer congeners *A. swaha* and *A. saraswati*, and they do not extend out of the Simla district into Kunawur." (Ent. Month. Mag., vol. iv, p. 246).

On the other hand, Mr A. Graham Young holds that the two species are distinct; he writes of *A. padma* that "it is fairly common in Kulu, and is double brooded, the first brood appearing in June on the grassy slopes amongst and above the upper forests, at an elevation of 10,000 feet or so; the second brood appears at a much lower elevation, from 3,000 to 4,000 feet. It is very punctual in its appearance, as in the fifteen years that I have observed this insect, it has never appeared earlier than the 1st or later than the 3rd October. It is an extremely powerful insect on the wing, and very difficult to take, it flies down one hill straight across the valley, and up the opposite hill at a great pace, keeping some ten feet from the ground, and very rarely settling," while of *A. avitara* he writes "confounded with the above by superficial observers and cabinet naturalists, it is smaller in size than *A. padma*, and much weaker in flight, taking but short flights, and is easily captured; a succession of broods appear throughout May, June, and July."

A. padma is found in suitable localities throughout the Himalayas from Kashmir to Sikkim. It is a forest-haunting insect, in Simla the males appear plentifully in May and again in July, but the female is usually very scarce, in 1882, however, it was abundant in October.

188 *Aulocera swaha*, Kollar.

Satyrus swaha, Kollar in Hugels Kaschmir, vol. iv, pt. 1, p. 444, n. 1, pl. xiv, figs. 1, 2 (1844); *Satyrus brahminus*, Blanchard in Jacquemont, Voy. dans l'Inde, vol. iv, pls. p. 22, n. 18, pl. 12, figs. 3, 6 (1844), male (in part). *Aulocera swaha*, Lang, Ent. Month. Mag., vol. iv, p. 246 (1868).

HABITAT: Himalayas.

EXPANSE: 2.6 to 2.8 inches.

DESCRIPTION. "UPPERSIDE obscure fuscous, glossed with greenish; with a common yellowish white fascia, in the forewing macular, with one ocellus, the ocellus blind. UNDERSIDE pale; the base and margins mottled with greyish; the median common fascia entire, the ocellus pupilled with white, the cilia varied with fuscous and yellow" (Kollar, l. c.).

A. swaha is the commonest species of the group; and is easily distinguished from *A. padma* by its smaller size, and by the bright bronzy brown, not black, colour of the underside; the white fascia of the upperside has in both sexes the inner white subcostal spot which is lacking in the male of *A. padma* (*A. avitara*), and terminates in the forewing in four white spots ranged round a blackish subtypical spot, there is also in many specimens a minute subcostal white spot beyond. On the UNDERSIDE the hindwing has a diffused greyish band from the apex, where it is broadest, along the outer and abdominal margins, marked with irregular dark brown undulations most densely along the abdominal margin, but more sparingly at the apex; in many specimens this band consists of greyish undulations on a brown ground, and in some there is an irregular dark brown very sinuous line between it and the fascia. The sexual mark in the male is usually very obscure in this species, but in some old specimens in the Indian Museum, Calcutta, it is very distinct, and extends into the cell. The FEMALE differs only in the more rounded outline of the wings, and in having the pale fascia rather broader and its edges less sharply defined. The colouration throughout is much paler.

Typically *A. swaha* has the median fascia creamy white on both wings on the upperside, and pale buff on the forewing, almost pure white on the hindwing, on the underside. There is a well-marked variety found at the higher elevations in which the fascia is on the upperside deep yellow on the forewing and buff on the hindwing; and on the underside bright yellow on the forewing and almost white on the hindwing. In these specimens the dark brown line beyond the fascia on the underside is more prominent. This is the form figured by Blanchard as the female of *A. brahminus*, but the specimens he figures are evidently males of this variety of *A. swaha*. Typical specimens of this variety are very distinct, but the gradations in tone of the yellow tint are so gradual in intermediate localities that it is impossible to draw the line of separation.

In the Western Himalayas *A. swaha* "abounds during the rainy season, from July to October, from the outer spurs overlooking the Indian plains, for two hundred miles into the interior of the mountain ranges towards the treeless regions of Spiti and Thibet." (*Colonel Lang*). In Kulu Mr. A. Graham Young writes:—"Not uncommon in its peculiar haunts, grassy hills at 7,000 to 8,000 feet elevation, from June to September." Its range to the eastwards is probably extensive in suitable ground, but we have no certain record of its occurrence in the Eastern Himalayas.

The next two species have a very different outline, the wings being more rounded and feebler in appearance; the outer margin of the forewing being decidedly convex.

189. *Aulocera brahminus*, Blanchard. (PLATE XVI, FIG. 49 ♂*).

Satyrus brahminus, Blanchard, in Jacquemont's Voy. dans l'Inde, vol. iv, Ins., p. 22, n. 18, pl. ii, fig. 4 (1844), male (in part); *Aulocera scylla*, Butler, Ent. Month. Mag., vol. iv, p. 122, n. 5 (1867); *Aulocera swerang*, Lang, Ent. Month. Mag., vol. iv, p. 247 (1868).

HABITAT: Himalayas.

EXPANSE: 2.4 to 2.7 inches.

DESCRIPTION: UPPERSIDE blackish brown, paler than in *A. swaha*; the discal white fascia very narrow and attenuated especially on the hindwing. Forewing with an inner white spot, making with the three upper spots of the fascia a group of four surrounding an indistinct oval black spot; two or three white dashes between the inner spot and the costa, as in *A. padma*, female. Cilia white interrupted with black at the end of each nervule. The sexual mark is very obscure. The FEMALE only differs from the male in the shape of the body, and the outline of the wings being more rounded; the colour and markings are identical. UNDERSIDE paler and brighter brown, irrorated with ochreous scales and with variable grey, ochreous, and dark brown markings; the white markings as on the upperside, but on the forewing the subapical black spot is pupilled with white; and on the hindwing are a few variable whitish suffused spots beyond the discal fascia.

In describing *A. brahminus*, Blanchard erroneously described the yellow variety of *A. swaha* as the female of *A. brahminus*; he gives a figure of the upperside only of a male *A. brahminus*, and figures of both upper and undersides of males of *A. swaha*, while in his description the two are so mixed up that it is difficult to ascertain what the markings of the true *A. brahminus* on the underside really are. So much of the original description as manifestly applies to this species is appended below for reference,† and it seems to us that the typical form of *A. brahminus* is that which is found at comparatively low elevations about 8,000 feet above the sea, in Kulu and Kashmir. This form is nearly as large as *A. swaha*, and most nearly resembles it on the underside; but the shape of the wings and the very narrow discal white fascia abundantly distinguish it from that species. The underside is comparatively uniform in colouration, bright brown; within the discal fascia the whole area of the hindwing is irrorated with ochreous; and towards the costal margin of both wings are numerous indistinct ochreous and darker brown striz; beyond the discal band the ochreous striz are less indistinct, and appear on the whole of the hindwing and on the apical half of the forewing, some grey striz also appear in patches at the apex of the forewing, and along the extremity of each nervule of the hindwing, most distinct at the apex and gradually disappearing along the inner margin; the hindwing also bears two or three suffused whitish spots beyond the fascia, and beyond them again a submarginal series of very indistinct suffused dark brown spots.

* Erroneously named *A. sweranga* on the plate.

† *Satyrus brahminus*, Blanchard. DESCRIPTION: "UPPERSIDE, both wings blackish brown, with a nearly straight oblique transverse white band a little beyond the middle; on the forewing consisting of a series of spots, the first four spots placed in pairs near the costal margin, then two others pyriform pointing outwards, the last quadrangular divided by the black submedian nervule, and reaching the inner margin; on the hindwing the band is almost straight, narrowed towards the anal angle, and interrupted only by the black nervules. UNDERSIDE, forewing with a black spot with a white dot in its centre near the apex; against the white band, along the costal margin and at the apex are some small white and brown striz. The hindwing is similarly striated throughout on each side of the transverse band except that towards the outer margin are some whitish spaces, and the base is also finely powdered with greyish." (Blanchard, l. c.)

Var. *weranga*, Lang. "MALE and FEMALE. UPPERSIDE blackish fuscous with a whitish discal fascia; the whitish fascia macular in the *forewing*, bifurcate at the apex, and including an oval black spot; arched on the *hindwing*, slender, obsolescent near the anal angle. *Cilia* white, variegated with black at the end of the nervules. UNDERSIDE scarcely paler, covered with fuscous stræ, *hindwing* greenish at the base, outwardly slightly ochraceous; *forewing* with a subapical spot bearing a minute white dot; *hindwing* with the discal fascia reaching the anal margin, and an exterior series of three subobsolete whitish dots. *Body* black; *antenna* with the tip obsoletely ochraceous on the underside. HABITAT: Upper Kunawur (Werang Pass), Kashmir (Goolmurg). EXPANSE: 2.6 inches." (*Lang*, Ent. Month. Mag., vol. iv, p. 247 (1868).

A. weranga is a rather smaller insect, and differs from typical *A. brahminus* in the far greater prominence of the ochreous stræ on the underside, so much so that in some specimens it appears as if the ground-colour were ochreous more or less densely striated with brown. Extreme examples are widely distinct from typical *A. brahminus*, but the gradations met with between the two forms renders it impossible to separate them satisfactorily. The extent of the grey stræ too varies greatly; in some specimens the greyish irrorations of the inner margin extend over the whole base of the hindwing. The whitish spots and the submarginal dark brown spots beyond are obsolete in some specimens, and very prominent in others.

Var. *scylla*, Butler. "MALE: UPPERSIDE blackish-fuscous, with a whitish discal fascia, macular on the *forewing*, slender and obsolete near the anal angle on the *hindwing*, bifurcate at the apex of the *forewing*, and including an oval black spot. *Cilia* whitish, variegated with black at the end of the nervules; *body* black; *antenna* with a yellow club. UNDERSIDE paler, covered with blackish stræ; the subapical spot of the *forewing* ocellated; *hindwing* very slightly yellowish, an outer discal series of whitish spots tinged outwardly with black, the discal fascia distinct at the anal angle. Most nearly allied to *A. brahminus*, but differs in its much smaller size, less sinuated margins, more slender central band, and on the underside in having a row of white spots placed in an arc outside the central band. I have seen three specimens of this species, which all appear to agree in size, pattern and colouration. HABITAT: near Sylhet. EXPANSE: 2.25 inches." (*Butler*, Ent. Month. Mag., vol. iv, p. 122, n. 5 (1867).

Colonel Lang in describing *A. weranga* writes, that "it differs from [the description of] *A. scylla* by its paler colour, larger size, more sinuated margins, and the want of the exterior series of white, black-encircled spots; the whitish dots of *A. weranga* being only two or three in number, very small, and indistinct." Mr. Butler adds, "the two species are nearly allied, but I think quite distinct;" another point of difference being that "the veins on the underside of the hindwing in *A. scylla* are powdered with whitish scales." We are quite unable to separate *A. scylla* from *A. brahminus*; it is described from "near Sylhet," and if that locality could be accepted definitely, there might be some grounds for its separation; but the authority for the habitat rests apparently on a very slender basis, and some specimens of *A. weranga* from the N.-W. Himalayas present every feature that is given as distinctive of *A. scylla*; it is doubtful whether it can even be retained as a distinct variety.

A. brahminus is found so far as we have any certain knowledge only in the N.-W. Himalayas at from 7,000 feet to 13,000 feet elevation; Mr. Graham Young took numerous specimens in 1880 in June on the Ser-ka-joth in North Mundi, two miles south of the Kulu frontier, and forty miles south of the snowy range at barely 8,000 feet elevation; these were all typical *A. brahminus*; Mr. de Nicéville found it very plentifully on the banks of the Chandra Bhaga river, in July, near Koksir on the borders of Lahoul at 7,000 feet elevation, and again at Kailang in Lahoul at about 9,000 feet in the same month; all his specimens being of the *A. weranga* form with the ochreous predominating on the underside, and one, a female from Kailang, has the nervures powdered with white scales and the whitish black-encircled spots of *A. scylla*; the types of *A. weranga* were taken by

Colonel Lang at "12,000 feet elevation, about 1,000 feet below the bleak and bare summit of the Werang pass, amidst the rocky, grassy ground just clear of the forests of *Pinus gerardiana* and *Cedrus deodara*;" in Lahoul, at Patsen, 11,000 feet elevation, specimens were taken in July by the Reverend A. Heyde, which differ from the usual form in the great predominance of the grey irrorations. In Pangl on the Säch pass Mr. R. Ellis took at an elevation of 13,000 feet in August and September some beautifully marked examples in which the prevailing ochreous is beautifully contrasted with the grey markings, and dark brown affix; the veins in these are powdered with white as in *A. scylla*; and finally a large series taken by Mrs. Bazett at Goolmurg in Kashmir in July at from 9,000 to 10,000 feet elevation, showed every gradation between typical *A. brahminus* and typical *A. ueranga*.

The figure (erroneously named *A. ueranga* on the plate) shows the upper and undersides of a male in the Indian Museum, Calcutta, taken in the Kulu Valley; of the typical *A. brahminus* form.

190. *Aulocera saraswati*, Kollar.

Satyrus saraswati, Kollar in Hügel's Kaschmir, vol. iv, pt. ii, p. 445, n. 2, pl. xiv, figs. 3, 4 (1846); *Aulocera saraswati*, Butler, Ent. Month. Mag., vol. iv, p. 121, n. 2 (1867). *idem*, id., Cat. Lep. B. M., *Satyrus*, p. 49, n. 2 (1868).

HABITAT: Himalayas.

EXPANSE: ♂, 2.7 to 2.85; ♀, 2.9 to 3.5 inches.

DESCRIPTION: "UPPERSIDE obscure fuscous, glossed with greenish, with a common whitish fascia, in the *forewing* macular, with one ocellus, the ocellus blind. UNDERSIDE yellowish, undulated with fuscous, the fascia whitish in the *forewing*, yellowish in the *hindwing*; the ocellus pupilled with white; the *cilia* varied with fuscous and white." (Kollar, l. c.)

The white fascia in this species is broader and more regular than in any other. On the UPPERSIDE in the MALE the inner white spot beyond the cell is small and in some specimens evanescent, as in *A. padma*, male; but the narrow white streak below the costa which is often present in *A. padma*, male, is altogether wanting in *A. saraswati*. The sexual mark varies much in prominence, being quite obsolete in some specimens. In the FEMALE the inner white spot is conspicuous, and in some specimens the oval black spot beyond it has a minute white pupil. The UNDERSIDE is very distinct, the basal half is very pale ochreous, fading to greyish white on the inner margin of the hindwing, marked throughout with dark brown stræ, the inner edge of the broad white fascia, which is almost equally whitish on both wings, is defined by a narrow dark brown lunular line, almost straight on the hindwing; beyond the fascia the ground-colour is ochreous marbled with brownish, merging into a diffused dark brown submarginal band, darker and broader on the forewing; the margin is pure grey along the nervules, ochreous in the middle of each interspace, and more or less marked throughout with fine brown stræ. The FEMALE is larger than the male and paler in colour, the markings on the underside similar, but less prominent.

According to Colonel Lang, "*A. saraswati* is not quite so widely spread, appears later, and disappears earlier than *A. swaha*; in August it swarms in the localities affected by it, amongst the luxuriant grass pastures on the less wooded slopes of the hills." In Simla it is not uncommon on the grassy slopes in the neighbourhood in the autumn months. In Pangl Mr. Robert Ellis and Dr. Hutchison took numerous specimens of both sexes in July and August. In Kulu, according to Mr. A. Graham Young, "it appears in July, and remains on the wing until the middle of October: it is common from 4,000 feet and upwards, and greatly affects the thistle flowers, upon which numbers may be captured in their peculiar haunts." There are specimens in the Indian Museum both from Kumaon and Sikkim, so that the range of this species is much wider than was thought when Colonel Lang wrote the note quoted above, fourteen years ago.

Genus 19.—**EPINEPHELE**, Hübner. (PLATE XV).*

Epinephele, Hübner, Verz. bek. Schmett., p. 59 (1816); *Satyrus* (in part), Westwood, Gen. D. I., vol. II, p. 388 (1851).

The genus *Epinephele* occupies almost the same range as *Hipparchia*, and is about equally numerously represented here, eleven species having been recorded from within Indian limits. They take the place of the "meadow browns" of England, and in the Himalayas are only found at considerable elevations, and they chiefly frequent grassy uplands. The genus comprises two well-marked groups, first those in which the males have a conspicuous brand on the forewing, composed of silky densely-packed scales, and extending along the median nervure below the cell, as in many species of true *Hipparchia*; and second, those in which the males have no trace of a brand on the forewing; this latter group contains the smallest species of the genus, indeed the smallest of the subfamily, with the exception of the still smaller *Ypthimas*. In the first group the shape of the anal angle of the hindwing (see Plate XV, fig. 39, *E. davyndra*), and in the second group the absence of the sexual brand in the male, distinguish them from *Hipparchia*, but the two genera are very closely allied. The antennæ in all the Indian species of *Epinephele* have a gradually-formed club, as also have some of the *Hipparchias*. None of the species of *Epinephele* have a complete series of ocelli on the underside of the hindwing, and in many of them that wing is altogether devoid of ocelli on both sides.

Key to the Indian species of *Epinephele*.

First group.

A. Males with a well-defined brand on the upperside of the forewing.

- α Males with the forewing fulvous with brown margins; the brand conspicuous, brown, on the fulvous ground; hindwing dentate near the anal angle. Underside with an angulate median dark line defined outwardly with whitish; the ocelli generally prominent.

α'. Female with the discal angulate dark line obsolescent on the upperside.

191. *E. DAVENDRA*, Western Himalayas.

δ' Female with the discal angulate dark line prominent on the upperside.

192. *E. ROXANA*, Beluchistan, Afghanistan.

- β. Male with the upperside as in α, but the hindwing quadrate and slightly dentate. Underside with three very irregular dark lines and clouded whitish fasciæ, no ocelli.

193. *E. NARICA*, Afghanistan.

- γ. Males with the forewing brown, the brand deeper coloured than the ground; hindwing less dentate near anal angle. Underside with the median dark line much more irregular, seldom prominent, and never defined with whitish, the ocelli small or evanescent.

α'. Female with two or three ocelli on the upperside of the forewing, ringed with fulvous and the space between irrorated with fulvous.

194. *E. CHERNA*, Western Himalayas.

δ'. Female with a single subapical black spot on upperside of forewing placed on a fulvous submarginal band.

195. *E. INTERPOSITA*, Beluchistan, Persia.

191. ***Epinephele davyndra***, Moore. (PLATE XV, FIG. 39 ♀).

Epinephele davyndra, Moore, Proc. Zool. Soc. Lond., 1865, p. 502, n. 94, pl. xxx, fig. 7, male and female.

HABITAT: Spiti, Pangi, Thibet, Ladak, Kabul.

EXPANSE: 1.75 to 2.0 inches.

DESCRIPTION: "MALE greyish brown. Forewing with the space within the discoidal cell to near the apex, and then descending to near the posterior margin ferruginous, this colour being distinctly defined; within it is a single black apical spot. [Or, in other words, the forewing

* *EPINEPHELE*, erroneously spelt *EPINEPHILE* on the plate.

is fulvous with brown margins, and the brown sexual mark extending from near the inner margin to near the apex of the cell below the median nervure.] **UNDERSIDE** with the costal and exterior margins of the *forewing* greyish brown, the inner space pale ferruginous, the apical ocellus with a white pupil and brown-bordered yellow iris, which latter, however, does not encircle the spot, being cut off as it were posteriorly; a short streak before the ocellus, and a submarginal line, dark brown. *Hindwing* grey, with delicate minute brown striz; a discal and a submarginal line dark brown, the former irregularly [even, but angulate] across the disc from middle of anterior to posterior margin, both bordered outwardly with pale white, and having a single anterior and two posterior black ocelli, each with a yellow* brown-bordered iris, and the anterior with a white pupil. **FEMALE** pale grey, the ferruginous space in the *forewing* ill-defined, and with a second black spot situated near the posterior angle [sometimes evanescent or altogether wanting]. **UNDERSIDE** as in the male, but with the lower black spot on the *forewing* as above, the anterior ocellus on the *hindwing* being minute or nearly obsolete. Allied to *E. eudora*." (Moore, l. c.)

"**Note.**—This is a Thibetian and Spiti insect, affecting the dry hot summer of the rainless region of the Chinese frontier. On a hot June or July day, these sober insects may be seen flitting about the stony hill-sides, 9,000 to 12,000 feet altitude—hill-sides where the *Graminaceæ* are scarce and brown, and grey *Artemisia* and *Ephedra* form the principal vegetation. They do not occur in the moister and more wooded regions of the Himalayas; but first appear on the confines of Upper Kunawur, in Spiti, and the Chinese provinces of Gughe and Nâri Khorsam (Thibet)." (Colonel A. M. Lang, R. E., l. c.)

The ocellation on the underside of this species is variable. In the specimens taken by Colonel Lang, who obtained the types, there are three ocelli on the underside of the *hindwing*, one subapical, two subanal; in the male all three are prominent, but never so large as in the next species *E. roxane*; in the female the subapical ocellus is more or less evanescent; in three males taken in Pangl in July by Dr. Hutchison, the subapical ocellus is absent entirely, and the subanal ones are very small, the dark lines too are very faint and less angulate, and their whitish borderings very indistinct, almost obsolete in one specimen. Two males taken by Mr. de Nicéville at Kargil and Nurla in Ladak, early in July, have all the ocelli large, almost as large as in *E. roxane*; one female from Kargil is similarly marked, another female from the same locality has a fourth small ocellus above the subapical one, and another female also from the same locality has only two ocelli, the lower subanal one being entirely wanting. In a male and a female, both taken at Sher Dawaza near Kabul by Lieutenant H. Whistler-Smith, the upper ocellus is entirely wanting; in a second male specimen from the same locality it is present; while in two females from Khistwar, Kashmir, the upper ocellus is obsolete. Moreover the three male specimens from Pangl, that we have referred to above, differ from all the others in the cilia on both wings, both above and below, being pale brown, not more or less white as in the specimens from the other localities; and the scalloping of the *hindwing* is much less deep.

The figure shows the upper and undersides of a female specimen in the Indian Museum, Calcutta, taken at Kabul by Lieutenant H. Whistler-Smith.

192. *Epinochele roxane*, Felder.

E. roxane, Felder, Reise Novara, Lep., vol. iii, p. 491, n. 840, pl. lxxix, figs. 22, 23 (1866), *female*; id., *Butter*, Proc. Zool. Soc. Lond., 1880, p. 405.

HABITAT: Western Himalayas, Kunawar, Spiti; Losar, Kargil, Ladak; Beluchistan.

EXPANS: 2'0 to 2'2 inches.

DESCRIPTION: "**FEMALE.** UPPERSIDE, hoary-brown; the margin immediately before the cilia fuscous. *Forewing* with the discal area pale fulvous, divided by a streak most often obsolete, and with one black blind ocellus and often another median incomplete, and bordered

* This must be an error: in all the specimens we have seen, including those in Colonel Lang's collection captured with the types of the species, the irides of the ocelli are white or grey, certainly not yellow.

with fuscous. *Hindwing* with a subangulate discal streak, and another submarginal almost obsolete; the ocelli of the underside more or less visible by transparency. *UNDERSIDE* paler, with a line before the cilia blackish-fuscous, and another on the cilia white. *Forewing* with the fulvous area paler, a little more extended, more distinctly divided and bordered, the ocellus larger, blacker, with a single white pupil and broad ochraceous iria, circled with fuscous; the costal and outer margins variegated with fuscous, and here and there irrorated with white. *Hindwing* with fuscous striz and hoary irrorations, the lines of the upperside much better defined and outwardly bordered with whitish powdery bands; a subapical ocellus often minute or wanting, and two near anal angle, black, blind, with white iris and circled with fuscous, often with whitish irrorations beyond the subapical ocellus."

"This species, reminding one, by the dentate outline of the *hindwing* and in the markings of the underside, of *H. parisatis*, is a local form of the Tibetan *E. davendra*, Moore. A specimen collected to the east of Pangl in Kunawar is considerably larger than those from Spiti." (Felder, l. c.)

E. roxane was for a long time considered identical with *E. davendra*, Moore; but Mr. Butler has recently recognised its distinctness with the following remark:—" *E. roxane*, although nearly allied to *E. davendra*, differs in its paler colouration, and the more deeply sinuated margin of the hindwing." (Butler, l. c.)

No specimen that we have seen from any of the localities quoted in the Western Himalayas can be separated from *E. davendra*, but the form found in the mountains of Beluchistan, which has been identified by Mr. Butler as *E. roxane*, is apparently a distinct geographical variety. It differs from *E. davendra* as stated above, and further by its larger size, and on the *UPPERSIDE* by the far greater prominence in the female of the discal band, and on the *UNDERSIDE* by the larger ocelli and the greater prominence of the fuscous striz and hoary irrorations. The *MALE* of this race differs from the male of *E. davendra* as in the female on the *UNDERSIDE*, and in its larger size, but the markings of the upperside appear to be identical. The ocellation varies in this species as in *E. davendra*. Dr. Felder figures a female with four ocelli on the underside of the hindwing; the males have generally three prominent ocelli, but in the females the subapical ocellus is minute or wanting, the two subanal ocelli being large and prominent. The lower ocellus on the forewing of the females is sometimes prominent, sometimes altogether wanting.

In South Afghanistan Captain Roberts found *E. roxane* "commonly at the end of May and in June," and Colonel Lang, R. E., and Colonel Swinhoe have also found it commonly in suitable places in the neighbourhood of Quetta in September and October.

Two other species, *E. comara* and *E. mandana*, which are found in Persia, have the same general style of markings as *E. davendra*, to which they are evidently allied. *E. comara*,* to judge from the figure, is closely allied to the form of *E. roxane* found in Beluchistan. The male chiefly differs on the upperside in having the dark margin of the forewing narrower, and the sexual streak less distinct; on the underside the forewing is more uniform fulvous; the basal half not perceptibly darker; there is no whitish streak from the costa, and the fulvous colour extends much further up within the ocellus. The female has on the upperside only a broad fulvous fascia, and a fulvous spot just beyond the cell; the basal area not at all irrorated with fulvous; on the underside the difference is as in the male, but much less pronounced.

* *Epinephele comara*, Lederer, Hor. Soc. Ent. Ross., vol. viii, p. 12, pl. 1, figs. 9 male, 10 female (1871). *HABITAT*: Astrabad, Persia. *EXpanse*: male, 1.9; female, 2.1 inches. *DESCRIPTION*: "*Hindwing* dentate. *UPPERSIDE* fuscous, the cilia whitish. *Forewing* of the male rufoescent-fuscous, margined with fuscous, and with a short transverse fuscous stripe, and a rounded black spot near the apex. *FEMALE* cinereous-fuscous, with an exterior yellowish fascia bearing a rounded black spot. *UNDERSIDE* of both sexes ochraceous, the black apical spot pupilled. *Hindwing* fuscous-cinereous, a median blackish striz, externally margined with white, and two black ocelli with white irides near the anal angle. The male resembles on the upperside that of *E. marica*, but the wings are less pointed and broader; the female corresponds more with that of *E. lycan*." (Lederer, l. c.)

*E. mandani** is a very beautiful species, and distinguished especially by the curious elongate shape of the black spot on the forewing, and the very highly dentate outline of the hindwing, the margin of which exhibits at least three distinct tails. From the rest of the *E. davendra* group it is also distinguished by the curved (not angulate) character of the white band on the underside of the hindwing. The female has often one, and sometimes two, round black spots below the spot on the forewing, and the whole of these spots are situated on a more or less prominent fulvous submarginal band defined inwardly, and diffused outwardly; the series of females from Persia in the Indian Museum, Calcutta, show considerable variation.

193. *Epinephele narica*, Hübner.

Papilio narica, Hübner, Eur. Schmett., vol. i, figs 704-707 (1825?); *Satyrus narica*, Boisduval, Icones, p. 212, pl. xli, figs 3, male; 4, 5 female (1832.)

HABITAT: South Russia, Western Asia, Afghanistan.

EXPANSE: 1·8 to 2·0 inches.

DESCRIPTION: MALE: UPPERSIDE brown; the *cilia* whitish. Forewing with the entire disc fulvous, the margin and the sexual streak alone being brown; colour and markings almost exactly as in *E. davendra*, but the outer margin is straighter in the forewing, and less dentate in the hindwing. FEMALE: UPPERSIDE very similar in aspect to *E. neozæ*, female, but with the *cilia* of both wings white, and the hindwing quadrate in outline owing to a prolongation of the discoidal nervule. Forewing fulvous, with cinereous-brown margins, the outer margin dusky, a black subapical spot, (and often a second submarginal spot in the lowest median interspace). Hindwing cinereous-brown, dusky towards the outer margin. UNDERSIDE also somewhat similar in pattern to that of *E. neozæ*, but paler in colouration. Forewing pale fulvous; a median indistinct angulate line across the wing, a black subapical ocellus with small white pupil and pale ochreous iris; the ground-colour between the ocellus and median line also pale ochreous merging in the iris; the costa narrowly hoary, mottled with fuscous; the outer margin more broadly cinereous-brown, darkest at inner angle, and a distinct submarginal slightly lunular dark line. Hindwing whitish, a subbasal and a highly irregular median fuscous line, between which the ground-colour is brown, forming a broad irregular sharply defined brown fascia; a brown suffused patch near the costa; then another brown submarginal band inwardly diffused, outwardly sharply defined by a narrow dark lunular line; the margin also clouded with brown, and the whole wing sparingly mottled with fuscous.

Described from Boisduval's figures and from a single female taken by Lieutenant-Colonel C. Swinhoe at Chaman, in South Afghanistan, on the 11th of May, and which is referred to by Mr. A. G. Butler in his Notes on Lieutenant-Colonel Swinhoe's collection as *E. interposita*.† This latter lacks the second submarginal black spot on the forewing, but otherwise corresponds exactly with Boisduval's figure. It has no resemblance to *E. interposita*; and its white *cilia* and quadrate hindwing at once distinguish it from *E. neozæ*, which it most nearly resembles in general aspect.

A closely allied species from the Kirghiz steppes and the Mangyschlag peninsula on the Caspian sea has been separated under the name of *E. naricina*.

Epinephele naricina, Staudinger, (*E. narica*, Hübner, var. ?), Berl. Ent. Zeitsch., vol. xiv, p. 100, n. 2 (1870). Smaller than *E. narica*, the smallest male measures 1·3 inches in expanse, and the female 1·5 inches, against a minimum of 1·54 inches in the male of *E. narica*. UPPERSIDE of the forewing as in *E. narica*, but the band of the male is narrower, even

* *Epinephele mandani*, Kollar, Denkschr. Akad. Wien Math.-Nat. Cl., vol. i, p. 52, n. 8 (1850). HABITAT: Persia. EXPANSE: 1·7 to 2·1 inches. DESCRIPTION: "Forewing entire; hindwing acutely dentate. UPPERSIDE cinereous-fulvous. Forewing with an oblong transverse silky black subcostal spot. UNDERSIDE: Forewing fulvous in the middle, with an abbreviated white fascia; a black ocellus near the apex, with yellow iris, and white pupil. Hindwing cinereous, with a white median arched fascia margined with fuscous; two ocelli near the anal angle black, with white iris. Allied to *E. rudora* [= *E. lycæon*] in size and shape, but the markings of the wings on the underside entirely different. Only two male specimens were brought from the alpine regions of South Persia by Kotschy. This species is also very closely allied to *E. wagneri*, Herrick-Schäffer, (Suppl. ad Lep. Eur. Hüb., pl. lxx, figs 312-313) from which it differs in having the wings on the upper side unicolorous cinereous-fulvous." (Kollar, l. c.) Mr. Kirby gives *E. mandani* as a synonym of *E. wagneri*.

† Ann. and Mag. of Nat. Hist., fifth series, vol. ix, p. 207 (1882).

allowing for its smaller size, and not so black. In the single *naricina*, female, and in one male there is beneath the subapical black spot a smaller one attached to it. On the **UNDERSIDE** of the *forewing* the single difference is that the dark shadowy median line which crosses the wing of *E. narica* is totally wanting in *E. naricina*. The **UPPERSIDE** of the *hindwing* is fuliginous-brown (blackish) as in *E. narica*, the only difference being that the cilia in *E. naricina* are almost totally white; only at the inner margin they show a trace of the dark middle line of *E. narica*, and on the first dentations are distinct dark spots in *E. naricina*; the **UNDERSIDE** of the *hindwing* forms the principal distinction between the two species, being in *E. naricina* without markings, almost as in *E. lycaon* or *E. cadusia*, [see foot note, p. 206], with which *E. naricina* has no affinity. The extremely sharp delineation of the underside of *E. narica* with its white nervures, white cross bands, dark middle band and distinct sharp dentated line at the outer margin is wanting in *E. naricina* almost totally. The underside is light ash-grey, with a few darker atoms, and somewhat whiter shadows beyond the middle. In spite of all this Staudinger considers that it will ultimately be found to be merely a variety of *E. narica*. (Abstracted from Staudinger's original description, l. c.)

194. *Epinephele cheena*, Moore.

Epinephele cheena, Moore, Proc. Zool. Soc. Lond., 1865, p. 501, n. 93, pl. xxx, fig. 6, male and female.

HABITAT: Western Himalayas.

EXPANSE: 1·8 to 2·3 inches.

DESCRIPTION: "MALE **UPPERSIDE** dark brown, with a subapical, black, ferruginous-encircled spot; also a similar minute spot some distance below it. **UNDERSIDE** pale greyish-brown. *Forewing* with its discal portion ferruginous; a medially submarginal dark brown streak, and an ill-defined discal transverse line; the subapical ocellus as above, but with a white pupil and yellow iris. *Hindwing* covered with minute delicate brown stræ. FEMALE with three black ferruginous-encircled ocelli, the upper and lower large, the middle one small. **UNDERSIDE** as in the male, but having the lower ocellus as on upperside, the middle one being obsolete. Allied to *E. janina*." (Moore, l. c.)

"*Note.*—The "meadow-brown" of the meadows of Rogi and Chini in Kunawar. It is limited in its range, not appearing to the westward, nor venturing further north and east into the drier lands affected by *Epinephele davendra* and [*Hipparchia*] *baldiva*." (Colonel A. M. Lang, R. E., l. c.)

E. cheena exhibits a considerable amount of variation; in a large series of MALES collected by Mr. de Nicéville at Budrawah and Jora in Kashmir in June, only two specimens show the second lower ocellular spot on the forewing; in all the others the only mark on the **UPPERSIDE** is a single subapical black spot, with its ferruginous iris, never prominent, often obsolete. In Colonel Lang's specimens from Kunawar the ferruginous iris of the subapical spot is always prominent, and the lower spot is represented in some specimens by a ferruginous spot, in others by a black spot with a rather prominent ferruginous iris, while in some a ferruginous spot is visible between the two ocelli; on the **UNDERSIDE** the *hindwing* is typically almost uniform in colouration and without markings; in some specimens are one, or two, small blind subanal ocelli; in some there is a highly irregular transverse discal dark line, the ground-colour immediately beyond it being paler, deepening again towards the outer margin. In the FEMALES the width of the ferruginous irides of the ocelli on the upperside varies much, in some the space between the ocelli is also ferruginous coalescing with the irides, and forming a ferruginous submarginal band, and often bearing a black spot between the ocelli; and in some the space between the ocelli and the end of the cell is also irrorated with ferruginous; on the **UNDERSIDE** the variations in the markings of the hindwing are as in the male.

E. cheena is the commonest of all the species in the Western Himalayas, and has the widest range. It has been taken at from 8,000 to 10,000 feet elevation in June, July, and August in Kashmir, Fangi, and Kunawar; and probably extends eastwards as far as Nepal.

195. *Epinephele interposita*, Erschoff.

E. interposita, Erschoff, Lep Turk., p. 29, n. 68, pl. ii, fig. 26 (1874), female; id., Butler, Proc. Zool. Soc. Lond., 1880, p. 405, n. 6, pl. xxxix, fig. 1, male.

HABITAT: Kandahar; Turkestan.

EXPANSE: 1·5 to 1·95 inches.

DESCRIPTION: FEMALE. "UPPERSIDE fuscous, with an obsolete paler outer band. *Forewing* with a black ocellus before the apex, broadly circled with yellowish. *UNDERSIDE*, *forewing* yellowish ferruginous, with the margin fuscous ashy. *Hindwing* fuscous-grey, with a median fascia defined with fuscous, clouded with whitish exteriorly, two small black ocelli before the anal angle, with paler iris. Described from a single 'female' (Erschoff, l. c.) The MALE is as yet undescribed, but has been well figured by Butler; the following description is taken from the figure. MALE. UPPERSIDE brown, slightly darker on the outer margin. *Forewing* with a single black subapical spot with a pale inconspicuous iris. *UNDERSIDE*, *forewing* fulvous, the basal half slightly darker and defined by an almost obsolete angulate median line, the margins ashy-brown, the black spot of the upperside but pupilled with white and with yellow iris, the upper half encircled with a fuscous line; and a fuscous submarginal line defining the fulvous area. *Hindwing* ashy brown, finely striated with darker brown; an irregular discal dark line, beyond which the ground colour is paler variegated with whitish, forming a pale fascia, and another similar pale submarginal fascia restricted to the anal half, and uniting at the anal angle with the inner complete fascia; two dark spots near anal angle.

E. interposita is evidently very closely allied to *E. cheena*, the only differences that can be detected on comparing MALES of *E. cheena* with Mr Butler's figure of the male are in the somewhat paler colouration of the latter, and the brighter and more extended fulvous patch on the underside of the forewing, in *E. cheena* the underside of the forewing is often ferruginous rather than fulvous, and the patch is often ill defined and somewhat obscure. Erschoff's figure of the FEMALE differs from females of *E. cheena* much more conspicuously; on the UPPERSIDE in *E. interposita* the ground-colour darkens to the middle of the wing, where it is sharply defined on both wings, the submarginal band beyond being dull fulvous on the forewing, and bearing a single subapical black spot, and on the hindwing obsolescent, whereas in *E. cheena* the colour is uniform, there are often two black spots on the forewing, and there is no trace of a submarginal band on the hindwing; the sides of the spots on the forewing are bright fulvous and often coalescent, forming an irregular submarginal band. On the UNDERSIDE the discal line on the forewing is less angulate in *E. interposita*, and there is only one subapical ocellus, on the hindwing there is no difference of importance, according to the figure it is similar in general appearance to that of the male, except that the whole outer half is paler, bearing a clouded submarginal band.

E. interposita has been recorded from Chaman and Kandahar, and is therefore included in our list, but it is rare and has been found in no other place within our limits. Major Roberts took one male in the middle of May, and one female at the end of May in the neighbourhood of Kandahar.

Of the former specimen Mr. Butler writes (Proc. Zool. Soc. Lond., 1880, p. 403), "it is much like a small *F. pallascens*, [see foot note, p. 207], male, on the upperside, but on the underside all the brown areas are replaced by whitish, and there are two minute obliquely-placed ocelli near the anal angle of the hindwing as in *E. hispulla*."

Of this group *E. lycaon** from Europe and Western Asia is the typical species, and is closely allied to *E. cheena*. The MALE differs on the upperside in having the black spot smaller,

* *Epinephele lycaon*, Kühn Naturf., vol. iii, p. 21 pl. ii figs. d-f (1774). HABITAT: Europe and Northern and Western Asia. EXPANSE: Male, 1·9, female 2·2 inches. DESCRIPTION: MALE. UPPERSIDE brown. *Forewing* with an indistinct silky sexual streak, a nebulous faintly variegated submarginal fulvous band, and a black subapical spot very indistinctly ringed. *Hindwing* unmarked except by a very indistinct submarginal lunular band, the *clava* brown. UNDERSIDE. *Forewing* fulvous, shaded with fuscous along the margins, the black spot of the upperside with distinct white pupil, but the iris scarcely discernible, scarcely any trace of a median dark line. *Hindwing* brown, faintly clouded with greyish on the disc, and finely freckled throughout with minute fuscous scales, no trace of ocelli, and the median angulate line scarcely visible. The FEMALE differs on the

and the *hills* less distinct; and on the underside in having the median dark line very faint on the hindwing, and almost absent from the forewing. The FEMALE differs in having on the underside the median line on the forewing continued straight to the costa and inner margin instead of merging into the wings of the ocelli; and the pale submarginal band on the hindwing is far more prominent. In a large series of this sex in the Indian Museum, Calcutta, obtained from Persia, the upperside has a dark discal fascia well defined externally, diffused inwardly on both wings, and two submarginal black spots, each with a broad pale yellow iris on the forewing.

E. pallescens, *E. amardaea*, *E. dysdora* and *E. cadusia* are also all found in Persia, and belong to this group; of these descriptions are appended below for reference.* The climate of the dry elevated regions in Persia seems peculiarly suited to the development of this genus.

A very distinct species of this group is described by Alphéraky from the neighbourhood of Kuldja under the name of *E. kirghisa*; it has both wings fulvous on the upper side, and margined with brown.

Epinephele kirghisa, Alphéraky, Hor Soc Ent Ross., vol. xvi, p. 423, n. 97, pl. xv, figs 24, 25, ♀ (1881) EXPANSION, ♂ and ♀, 1.8 inches DESCRIPTION: "Forewing entire, hindwing subdentate. UPPERSIDE dilute fulvous, with two rounded black spots (one subapical and the other in the first median interspace), larger in the female, sometimes with white pupils, and the margin of both wings swarthy. MALE with a subcellular greyish-fuscous

upperside in lacking the sexual streak, the ocellus is often distinctly white pupilled, and with a second coherent black spot below, and often another lower black spot, each with a distinct though narrow yellowish line the submarginal band of fulvous irroration is much more distinct and often divided into streaks by the fuscous nervules. UPPERSIDE with the ocellus as on upperside the iris wider a median dark line on both wings, beyond which is a broad submarginal fascia fulvous. on the forewing, greyish ochraceous on the hindwing, the basal half of the forewing washed with fulvous, the outer margin of both wings broadly darker than the basal half (Described from specimens from Prussia.)

* *Epinephele pallescens*, Butler, Cat Lep B M., Satyridæ, p. 65, n. 8, pl. iii, fig. 3 (1868), female. HABITAT Persia. EXPANSION Male, 2.5, female 2.1 inches DESCRIPTION UPPERSIDE pale olivaceous-fuscous, the *cilia* whitish. Forewing of the MALE with a meriscent internal basal fascia the outer margin slightly fuscous a black subapical dot of the FEMALE with a discal cellular spot and two elongate and a dot, discal arranged in a direct series. Golden yellow a large black subapical ocellus with two pupils placed obliquely (the lower smaller), and irregularly circled with fulvous. Hindwing in both sexes undulated. UPPERSIDE almost as in *E. ida* (Butler, l.c.). We have no specimens of *E. ida*, but from Godart's description of this and Butler's uncoloured figure of *E. pallescens* we gather that on the UNDERSIDE the forewing is fulvous with a median striga, within which the basal half is, in what is added with darker, the *celius* is on upperside, and the costa narrowly and the outer margin broadly fuscous. Hindwing of the male and female with greyish, a median very angulate line from costa to inner margin beyond which the ground colour is whitish gradually darkening, and bearing another indistinct submarginal line no trace of ocelli. It is evidently very close to *E. lycæon*.

Epinephele amardaea, Lederer, Hor Soc Ent Ross., vol. vi, p. 84, pl. v, figs 3 male, 4 female (1869). HABITAT Astrabad, Persia. EXPANSION Male, 1.4, female, 1.5 inches DESCRIPTION UPPERSIDE fuscous, Forewing with a subapical black spot (on a fulvous disc in the female). UPPERSIDE forewing fulvous with two brown strigæ, and a subapical spot with white pupil. Hindwing greyish, with three serrated fuscous strigæ, washed with hoary outside the second, and two submarginal dots adhering to the inner edge of the third striga. The UNDERSIDE is darker, and the markings are more sharply defined than in *E. lycæon*. Forewing with the outer margin grey brown, the costal margin with darker stripe a dark transverse line across the cell, one median across the wing beyond the cell, and one submarginal—the latter edged paler outwardly (Lederer, l.c.).

Epinephele dysdora, Lederer, Hor Soc Ent Ross., vol. vi, p. 85, pl. v, figs 1 male, 2 female (1869). HABITAT Astrabad, Persia. EXPANSION Male and female, 1.75 inches DESCRIPTION UPPERSIDE fuscous, with a subapical black spot on a fuscous band (and in the female another smaller below it). UPPERSIDE forewing fulvous, a fuscous striga before the subapical white pupilled spot. Hindwing cinereous, a sharply defined striga beyond the middle, outwardly washed with whitish two submarginal black dots with yellow irides. Also allied to *E. lycæon* but the markings of the underside much clearer and more delicate. UPPERSIDE dark brown as in *E. lycæon* the hindwing slightly scalloped. the *cilia* brown grey. Forewing in the MALE with a black ocellus at the apex in the fulvous band, which band appears towards the inner margin and is somewhat diffused inwardly, and crossed by fuscous veins. The FEMALE has the two black spots surrounded by faint yellowish irides, the fulvous band defined inwardly by a fuscous striga within which the ground colour is again suffused with fulvous for a short distance (Lederer, l.c.). In the figure of the UNDERSIDE the forewing is fulvous with brown margins, the spots as on the upperside, a dark median line across the wing and a dark submarginal line outwardly defined with whitish. Hindwing grey brown, an incomplete subbasal striga, a dark median dentate striga ending just above the anal angle on the inner margin, outwardly defined with whitish, which shades off into the brown beyond, a pale indistinct submarginal fascia, and lunular marginal band, the two submarginal ocelli near the inner edge of the pale submarginal fascia.

Epinephele cadusia, Lederer, Hor Soc Ent Ross., vol. vi, p. 84, pl. iv, figs 10 male; 11, female (1869). HABITAT Astrabad, Persia. EXPANSION: Male, 1.5, female, 1.6 inches DESCRIPTION UPPERSIDE fuscous, the *cilia* whitish, the disc fulvous including a black subapical spot (subgeminate in the female, with another smaller one below). UPPERSIDE forewing fulvous, with a single brown striga, and a subapical spot with white pupil. Hindwing fuscous-hoary a median fuscous striga bent backwards, outwardly washed with whitish. Very close to *E. lycæon*, but smaller, with more rounded wings and whitish *cilia*. the forewing in the male with a fulvous band diffused on the inner side (as in *E. lycæon*, var. *tethysia*). The UNDERSIDE as in *E. lycæon*, the coloration, however, much lighter, whitish grey, the markings brown grey. Very common. (Lederer, l.c.).

diagonal fascia, outwardly dentated [the usual male mark] **UNDERSIDE:** *Forewing* paler, bordered with cinereous, the round spots fuscous, pupilled with white (the lower one blind in the male). *Hindwing* cinereous, irrorated with fuscous, two subanal black dots circled with dilute grey." (*Alphéraky*, 1 c.) In the figures the basal area of both wings is clouded darker on the upperside, especially in the female; the *hindwing* on the underside has a distinct dark median line, and an indistinct submarginal and abbreviated basal line. The underside is very similar to that of *F. pulchra*, but the *forewing* has two black spots, and the *hindwing* has the markings prominent.

The next group in which the males lack the sexual mark altogether appears to be confined to the Western Himalayas and Central Asia, and is perhaps worthy of generic separation.

Key to the Indian Species of *Epinephele*.

Second Group.

B. Males with no perceptible band on the upperside of the forewing.

a Underside hindwing brown, with numerous darker strizæ and three irregular transverse more or less conspicuous dark lines.

a' Upperside with the forewing fulvous, narrowly margined with brown and with no trace of a discal line.

196 E. *PULCHELLA*, Western Himalayas.

b' Upperside, forewing fulvous with broader brown margin and obscure indistinct discal line.

197 E. *NEOLA*, Kashmir.

c' Upperside forewing brown, more or less distinctly irrorated with fulvous except on the margin; the fulvous patch when distinct divided by a broad diffused transverse discal line.

198 E. *PULCHRA*, Western Himalayas.

Underside hindwing ferruginous brown, with yellowish irregularly disposed spots and blotches.

a' Male with two ocelli on upperside of forewing underside of hindwing in both sexes with dark interrupted discal line, and with the basal area darker.

199 E. *CÆNONYMPHA*, Western Himalayas.

b' Male with upperside unspotted or with only a single subapical minute indistinct black spot underside, hindwing with the ground colour uniform no submarginal ocelli.

200 F. *MAIZA*, Kashmir.

c' Male unknown, female with an incomplete row of submarginal ocelli on the underside of hindwing.

201. E. *COOLMURGA*, Kashmir.

196. *Epinephele pulchella*, Felder (PLATE XV, FIG. 40 ♂ left hand half)

E. *pulchella*, Felder, Reise Novara, Lep., vol. III, p. 490, n. 847, pl. LXIX, fig. 16 (1866), male, id., Moorg., Proc. Zool.-Soc. Lond., 1874, p. 566.

HABITAT: Western Himalayas, Spiti, Ladak.

EXpanse: 1.6 to 1.9 inches.

DESCRIPTION: "MALE UPSIDE brown. *Forewing* with a large discal patch extending to the base, fulvous; a blackish spot near the apex. *Hindwing* unmarked. **UNDERSIDE** much paler. *Forewing* with the patch of the upperside but more restricted, deeper coloured, the black spot of the upperside larger, circled with a broad diffuse ochraceous iris, often bearing a white dot; the costal and external margins around the patch irrorated with hoary and variegated with fuscous, a fuscous streak often composed of dentate lunules defining the outer edge of the patch. *Hindwing* variegated with hoary and covered with fuscous strizæ; a basal and a discal streak very flexuous, and a third submarginal, maculæ, blackish-fuscous, more or less conspicuous. **FEMALE.** *Forewing* with the patch paler. **UPSIDE** with the blackish subapical spot larger, circled with dilute fulvous, sometimes with another smaller spot between the first and second median branches." (Felder, 1. c.)

"Differs from *E. neosa*, Lang, in being smaller, in the ferruginous [fulvous?] on the forewing being more distinct in the male, and in the absence of the transverse discal fulvous brown line on the forewing." (Moore, l. c.)

The localities given for this species by Dr Felder are Spiti; Losar, Dishungdeo, Kibber, Shalkar, Rupshu, and Rumbog in Ladak; Karnag; Nui Sumdo, 15,000 feet; Padam; Abrang; and Marsmag. Mr de Nicéville took a large series of males and a single female at Dras and Tashgam in Ladak in June; and according to Moore, Captain Hellard took it in Kashmir, and Major J. Biddulph took a male specimen at Astor at 7,700 feet altitude in September. It appears to affect higher elevations and to occur further in the interior than *E. neosa* does.

The left hand half of the figure shows the upperside of a male in Mr. de Nicéville's collection from Dras, Ladak. The other half of the figure refers to *E. pulchra*, male, not *E. pulchella*, female, as erroneously entered on the plate.

197 *Epinephele neosa*, Lang.

Epinephele neosa Lang, Ent Month Mag, vol v, p 35 (1868)

HABITAT: Western Himalayas

EXPANSE: 1·6 inches (Lang); 1·85 actual measurement of the female type specimen.

DESCRIPTION: "MALE: UPPERSIDE greyish-brown. Forewing with the discal portion broadly suffused with a satiny brownish-ferruginous, a single apical black spot. UNDERSIDE: Forewing with markings as above, but the disc is brightly ferruginous and separated from the grey brown exterior margin by a narrow, sinuous, darker line, and the apical spot has a minute white pupil and diffused yellowish iris. A transverse line, scarcely distinct ferruginous line, strongly angulated outwards below the ocellus, crosses the wing beyond the middle. Hindwing, greyish-brown, minutely striated and freckled, with three transverse, sinuous and dentated lines darker, the first basal, the second discal, the third simulating a submarginal series of connected lunules. FEMALE: Markings generally as in the male, but the disc of forewing on upperside brightly ferruginous, the apical spot larger, and with an indistinct paler ferruginous iris. On the hindwing the submarginal lunular line of the underside appears very indistinctly (or not at all) on the upperside" (Lang, l. c.)

The type female specimen of *E. neosa* in Colonel Lang's collection differs from the Ladak female of *E. pulchella* in Mr de Nicéville's collection in being larger, the subapical spot is also larger, the fulvous patch slightly darker, and the outer brown margin rather wider. On the underside the discal angulate line on both wings is rather more distinct in *E. neosa*.

198. *Epinephele pulchra*, Felder. (PLATE XV, FIG. 40 ♂, right hand half.)

E. pulchra, Felder, Reise Novara, Lep. iii, p 492, n 848 (1866).

HABITAT: Western Himalayas.

EXPANSE: 1·6 to 2·0 inches.

DESCRIPTION: "MALE. UPPERSIDE as in *E. pulchella*, but the forewing with the fulvous patch less bright, divided by the fulvous [fuscous?] nervures, and cut through beyond the middle by an obsolete fuscous angulate streak, within which it is irrorated with fuscous; the margin of the ground-colour beyond wider than in *E. pulchella*, the blackish spot larger; the hindwing irrorated with fulvous on the disc. UNDERSIDE as in *E. pulchella*, but the patch of the forewing more restricted and brighter fulvous, divided beyond the middle by the streak of the upperside, but obscure ferruginous and more distinct and the ocellus larger." (Felder, l. c.) FEMALE: UPPERSIDE as in the male, but the forewing with the fulvous patch brighter, the subapical spot larger, its iris more distinct, and the fuscous angulate discal streak more prominent.

E. pulchra seems to be even more closely allied to *E. neosa* than to *E. pulchella*; typically it is a much darker insect both on the upper and undersides. On the upperside the

fulvous patch is in some specimens almost altogether obsolete, and in these there is little or no trace of the dark discal line; in others, where the fulvous patch is more prominent, the transverse discal line is prominent also, and the brown margin is wider; but the patch is never so large, so continuous, or so pale as in *E. nana*; on the underside the markings appear to be identical, but *E. pulchra* is much the darker.

Dr. Felder gives Kunawar; Pangî, Bisahir, and Chini for this species. Mr. de Nicéville took several males at Dras and Tashgam, Ladak, in June; Mr. R. Ellis took it in Pangî in July; Mrs. Bazett took it in Kashmir at Baba Matishi, at 8,400 feet elevation in June, at Katabal at 10,000 feet, and at Goolmurgat 9,400 feet, in July. Major J. Biddulph took a pair, male and female, on the Shandur plateau in northern Kashmir; the female having on the forewing a second black spot placed on the lower median interspace, both spots prominently circled with pale ochraceous, the irides coalescing. Mr. A. Graham Young has sent a single female from the Kulu Valley.

The right hand half of the figure shews the upperside of a male in Mr. de Nicéville's collection from Dras, Ladak, and is not that of a female of *E. pulchella*, as erroneously given on the plate. The other half is correctly named *E. pulchella*, male.

Erschoff in his Lep. Turkestan describes and figures as *E. amardea*, var. *naubulensis*, a species which seems clearly to belong to this group, and to be closely allied to *E. pulchra*. His description is as follows: "MALE: UPPERSIDE without ocelli. UNDERSIDE: Hindwing unicolorous grey, median fascia almost wanting." The figure shows a very small male insect 1.4 inches in expanse, with no sexual brand on the forewing. The UPPERSIDE of both wings brown, darkest at the outer margin; the cilia paler. UNDERSIDE: Forewing fulvous, the outer margin broadly pale brown, with two dark submarginal lines, a subapical small ocellus, and a smaller submedian black spot below; the hindwing uniform pale brown, with indistinct dark stræ; and indistinct, but somewhat regular, subbasal, median and marginal dark lines. It is most like *E. pulchra* but smaller, with no trace of the fulvous patch on the upperside, and with two black spots on the underside, and none on the upperside in the forewing. In his paper on the Lepidoptera of Kuldja and the neighbouring mountains (Hor. Soc. Ent. Ross., vol. xvi, p. 425 (1881), Alphéraky also records a species belonging to this group with the following remarks: "*Epinephelæ* species? Some males of a species probably new, which have also been taken in the Altai by Haberhauer. Dr. Staudinger had determined them as *E. pulchella*, Felder, and truly it is a species closely allied to this latter to judge from the underside especially. I have since received from Dr. Staudinger a male under the name of *E. naubulensis*, Erschoff, which does not appear to me to be distinct from the doubtful *E. pulchella* from the Altai." All these remarks appear to us to apply to one and the same species, which is nearest to *E. pulchra*, not *E. pulchella*, but closely allied to both, and which should stand as *E. naubulensis*, Erschoff.

199. *Epinephelæ cononympha*, Felder.

E. cononympha, Felder, Reise Novara, Lep, vol. iii, p. 494, n. 850, pl. lxiix, figs. 14, 15 (1866), female.

HABITAT: Surroo, Ladak; Western Himalayas.

EXPANSE: ♀, 1.65 inches.

DESCRIPTION: "MALE: UPPERSIDE fuscous, with the forewing below and the hindwing above the internal nerve obscurely and shiningly hoary, [this is not quite clear, and there is no trace of it in the figures which accompany the description]. Forewing with an ocellus between the discoidal nervules, and another between the first median nervules, blackish-fuscous, blind, incomplete. UNDERSIDE hoary-fuscous, paler in the exterior region, with a very obsolete submarginal line. Forewing with a large fulvous discal patch, ill-defined, divided by a fuscous disco-cellular streak, and a most indistinct small fuscous fascia beyond the cell; the ocelli of the upperside blacker, the upper one with an indistinct ochraceous iris. Hindwing densely irrorated with blackish at the base, with a large fulvous patch on the upper base, with

a smaller one above coalescing with it, circled with fuscous [the fuscous cincture is not shown in the figure]; the basal region darker, defined by an interrupted flexuous fuscous streak, and margined externally by seven unequal spots, the larger median one excepted, fulvescent, contiguous; with a minute posterior ocellus, obsolete, broadly circled with ochraceous. FEMALE: UPPERSIDE as in the male. Forewing beyond the cell shaded with darker, with two blind black ocelli, but broadly circled with ochraceous, (especially the upper smaller one). Hindwing showing the markings of the underside. UNDERSIDE as in the male, but darker. Forewing with the ocelli larger, more distinct, and with minute white pupils. Hindwing with two blind, whitish, subanal spots" (Felder, l. c.)

We have never seen *E. canonympha*, and the type specimens collected by Dr. Stoliczka are apparently unique. It is closely allied to both *E. maiza* and *E. goolmurga*, and approaches the latter most closely by the presence of a subanal ocellus on the underside of the hindwing: the colour is much darker in the figure of the female than that of the females of *E. maiza* and *E. goolmurga* which we have seen, but not darker than fresh males of *E. maiza*. The principal points of distinction appear to be that in *E. canonympha* the male has two ocelli on the UPPERSIDE of the forewing, and on the UNDERSIDE the fulvous patch on the forewing occupies the entire wing, excepting the narrow brownish margins, and no trace of the discal streak is shown in the figure; whereas this streak is very prominent in *E. maiza*, and on the hindwing the basal area is much darker than the outer area, and edged with an interrupted dark brown lunular line, and the yellowish spots beyond appear to coalesce; whereas in *E. maiza* the colour of the hindwing is uniform, the dark line is absent, and the yellowish spots are well separated, but all these characters are variable, and it is possible that further research will show that *E. maiza* is really inseparable from *E. canonympha*.

200. *Epinephele maiza*, Lang (PLATE XV, FIG 41 ♀).

Epinephele maiza, Lang, Ent. Month. Mag., vol. v, p. 36 (1868), id., Moore, Proc. Zool. Soc. Lond., 1874, p. 265, pl. XLII, fig. 6, male

HABITAT: Goolmurg and Pir Pinjal, Kashmir.

EXPANSE: 1.5 to 1.6 inches.

DESCRIPTION. "MALE. UPPERSIDE dark brown. Forewing with a small, scarcely perceptible ocellus [this ocellus is often entirely absent, the upperside being uniform unspotted brown] Underside ferruginous brown. Forewing with the discal portion clear ferruginous, traversed by the dark nervures, and crossed by an angular discal band; a small subapical ocellus, distinct, iris yellow, white-pupilled. Hindwing with a small subbasal ferruginous patch, and an irregular transverse discal series of yellowish spots". (Moore, l. c.) "FEMALE: UPPERSIDE as in *E. goolmurga*, Lang, but with the irides of the ocelli much smaller and darker. UNDERSIDE generally as in *E. goolmurga*, but in the forewing the greyish-brown borders and the transverse discal line are much broader and darker. In the hindwing the colour is clear, unclouded brown; the basal ferruginous patch is larger, the discal series of cuneiform spots is incomplete and indistinct, formed of smaller, darker spots, and the four submarginal ocelli are entirely wanting. The forewing is slightly broader, and has a more rounded apex and more convex exterior margin than in *E. goolmurga*."

"Were this insect and *E. goolmurga* male and female, they would be indubitably set down as sexes of one species, but both appear to be females; these may, however, pertain to one species, which is variable, and of which a larger series must be obtained before its character can be correctly defined" (Lang, l. c.)

The FEMALE only appears to differ from the male so far as markings are concerned in having on the forewing two blind ocelli on the upperside, and two ocelli with minute white pupils on the underside.

Two specimens of the male from the Pir Pinjal, Kashmir, differ only from a female from the same locality on the upperside of the forewing having but one minute black subapical

spot very faintly surrounded with ferruginous, and on the underside in having only one subapical ocellus on the forewing, which is rather smaller than in the female. A large series of the males collected by Mrs. Bazett, at Goolmurg, in July at from 9,000 to 10,000 feet elevation, have no trace of the black subapical spot on the upperside, being of an uniform unspotted dark brown throughout. *E. maiza* appears to be common at Goolmurg, but with the exception of the three specimens from the Pir Pinjal in the Indian Museum we have seen it from no other locality.

The figure is taken from the female specimen from the Pir Pinjal, and shows both upper and undersides.

201. *Epinephele goolmurga*, Lang.

Epinephele goolmurga, Lang, Ent. Month Mag., vol. 7, p. 36 (1868)

HABITAT. Goolmurg, Kashmir

EXPANSE: 1.6 inches.

DESCRIPTION: "FEMALE: UPPERSIDE dark brown. Forewing with two rather large black spots, broadly encircled with pale ferruginous, one subapical, the other near posterior angle. UNDERSIDE greyish-brown. Forewing with discal portion ferruginous; ocelli 4, above, but with rides smaller, and with minute white pupils; an indistinct streak closing the cell, and beyond it a transverse discal line, angulated externally beyond the ocelli. Hindwing irregularly and indistinctly tinted with fuscous, ferruginous, greenish and glaucous, but a large medial, ferruginous patch near base, a curved discal series of seven irregular caneiform spots, pale yellowish ferruginous, and an incomplete submarginal series of small ocelli, black with yellowish rides; two below apical and two above anal, angle. HEAD, thorax, abdomen, palpi and antennæ, brown; eyes ferruginous" (Lang, l. c.)

The MALE is unknown. *E. goolmurga* is evidently very closely allied to the preceding species, *E. maiza*, but the type specimen which, so far as we know, is unique, differs from the female of *E. maiza* to an extent which warrants its being kept distinct till more specimens are obtained, the differences are detailed in the description of *E. maiza*, female, which precedes. The type specimen was taken by Dr. Jerdon at Goolmurg at 9,000 feet elevation.

Genus 20 — YPETHIMA, Hübner. (PLATE XVII)

Ypethima, Hübner, Verz. bek. Schmett., p. 63 (1816), id., Westwood, Gen. D. L., p. 394 (1851). *Ypethima*, Hewitson, Trans. Ent. Soc. Lond., third series, vol. 11, p. 283 (1864), *Monograph*.

"BODY small; wings rather large, entire, uniformly and plainly coloured, the forewing generally with a large ocellus near the apex. HEAD small, clothed with long hairs in front. Eyes prominent, naked. Antenna not half the length of the forewing, very slender, ridged with white; terminated by a very slender club, gradually formed, with the joints short, and finely carinated beneath on the innerside. Palpe rather long, slender, acute at the tip, corrected obliquely, straight, compressed, the tip elevated to the level of the top of the eyes, and extending forward further than the length of the head, clothed beneath with long, straight, divergent, slender, bristly hairs; the terminal joint being but slightly hairy. Thorax small, clothed in front with woolly hairs. Abdomen elongated, slender, rather thickened at the tip in the males. FOREWING large, elongated, triangularly-ovate; costal margin well arched; apex rounded; outer margin entire, convex, about two-thirds of the length of the costal margin; inner margin nearly straight, three-fourths of the length of the costal margin. Costal nerve strongly swollen at the base. Subcostal nervure with its first branch arising just before the anterior extremity of the cell; the second, third, and fourth branches arising at equal distances apart; the second at a considerable distance beyond the cell. Upper disco-cellular nervure nearly obsolete, arising at about half the length of the wing. Middle disco-cellular curved towards the base of the wing. Lower disco-cellular much longer, nearly continuous with the middle one, and united to the third branch of the median nervure at a short distance beyond its origin. Median nervure moderately [sometimes greatly] swollen at the base. Submedian nervure simple.

HINDWING triangularly ovate; costal margin rounded, as well as the outer margin, which is entire; inner margin slightly emarginate towards the extremity. Costal nerve extending to about two-thirds of the length of the costa. Subcostal nerve arising just opposite to the præcostal one; its branch arising at a considerable distance from the base. Upper disco-cellular arising at a short distance from the origin of the branch, oblique, slightly curved. Lower disco-cellular longer, also oblique, and very slightly curved; uniting with the third branch of the median nerve at a little distance beyond its base. FORELEGS of the MALE extremely minute, hairy, concealed among the hairs of the breast. COXA long; remainder forming a very small oval articulated mass, much shorter than the coxa. Forelegs of the FEMALE small, but quite distinct, several times longer than those of the male. scaly, destitute of long hairs; the tibia shorter than the femur. Tarsus about equal in length to the tibia, rather widened to the tip, articulated; the tips of the joints beneath furnished with short spines. Claws wanting. Four hindlegs scaly, moderately elongate and slender; the femur moderately clothed beneath with hairs; tibiae scaly, scarcely spined beneath, tibial spurs long; tarsus with longer spines on the sides beneath. Claws strong, curved, entire. Paronychia minute." (Westwood, l. c.)

Ypthima, or as it is sometimes spelt *Hyphthima*, *Yphthima*, and *Ipthima* is chiefly an Indian genus. Of the (about) forty species known, no less than twenty-six are found within our limits, but it has a peculiar distribution. Of the Indian species, eight are found in the Western Himalayas, one of which extends to the Eastern Himalayas, and another is found all over India in plains and hills, in suitable localities; one is found in Beluchistan; nine are found in the Eastern Himalayas and Khasi hills; three are found in the plains of North-east India; six are found in Burma; six are found in Central India; six at least are found in South India, of which three appear to be confined to particular ranges of hills; and three are found in Ceylon; but from the Andamans and Nicobars none have been recorded. Beyond our limits a few species are found in Africa, one in Madagascar, a few in the Malay Archipelago and Australia, and others in Japan and China extending to Amoorland.

The species of *Ypthima* are for the most part small insects, none reaching 2½ inches in expanse, and some of them are among the smallest of the *Rhopalocera*, the *Lycæna* and *Hesperidæ* alone excepted. They are for the most part brown insects with ocelli on both sides of the wings, the underside being almost always finely reticulated with brown undulations on a paler ground; they have almost invariably a bipupilled ocellus on each side of the forewing, and from three to seven ocelli on the underside of the hindwing; but occasionally the ocelli on this wing are entirely wanting; on the upperside of the hindwing they are very variable even in the same species. In habits they are very similar to *Erebia* and *Callerebia*, occurring almost everywhere both in the hills and plains where there is grass, amongst which they take short weak flights, and continually settle; but they differ in distribution, the two latter being palaearctic forms, and only occurring within our limits in the Himalayas and outlying ranges. They may be distinguished from *Callerebia* by their usually much paler colouration, the prominence of their ocelli and of the undulations of the underside. Structurally they differ in the arrangement of the subcostal nervules of the forewing, having the first branch close to the end of the cell, the other three at equal distances beyond, while in all the other genera of this subfamily, except *Ragadia*, the first and second subcostal nervules both originate before the end of the cell; the median nerve of the forewing is usually only slightly swollen at the base, showing an approach in this feature to *Callerebia*, which feature is particularly noticeable in *Y. nikae* which occurs on the same ground as the *Callerebias*; in only one species, *Y. bolanica*, is the median nerve highly dilated at the base.

The genus is, as in the case of *Epinephele*, *Amicta* and others, divisible into two groups, one of which has, and the other has not, a patch of densely packed scales on the forewing of the male insect. There has been considerable difficulty in identifying the species of *Ypthima*, owing to this fact not having hitherto attracted attention, and to the meagre nature of the original descriptions which based the characters in many instances on the numbers of the ocelli—a very inconstant feature, or on comparison with other species to which they were erroneously supposed to be allied. But though the number of the ocelli is an unsafe guide,

the arrangement of them is distinct in all the various minor groups, and affords at once a clue to the affinities, due regard being always had to the fact that the disappearance of one or more, or the appearance of an additional one may frequently be looked for, it will be found that the incomplete or inflated series always gives sufficient trace of the original arrangement to make the identification easy. The ocelli of the upperside of the hindwing are too variable in many species to afford any guide whatever, while in others they seem fairly constant. The arrangement of the ocelli of the underside of the hindwing is given special prominence in the key.

Key to the Indian species of *Ypthima*.

First group.

- A. Males with a broad patch of more densely packed scales on the upperside of the forewing along both sides of the median nervure with a somewhat silky appearance

— UNDERSIDE of the hindwing with three ocelli placed one near apex, and two near anal angle.

202. *Y. MOTSCHULSKII*, Khasi hills.

UNDERSIDE of the hindwing with six ocelli (very rarely seven).

a¹. These ocelli placed in pairs in echelon, sometimes prominent, sometimes reduced to minute dots. The striation distinct

a². Underside with only an indistinct median fascia

203. *Y. MITHORA*, North India (? Yunnan.

Y. NEWBOLDI, Malacca

b⁰. Underside with subbasal, median, and submarginal fasciæ more or less distinct

204. *Y. PHILOMELA*, India, Himalayas, Burma.

205. *Y. MARSHALLI*, Tenasserim.

b¹. These ocelli reduced to minute dots, often entirely wanting, but when visible arranged as in *Y. philomela*, the striation indistinct, the fasciæ clouded and often tinged with ochreous.

206. *Y. INDECORA*, Western Himalayas

c¹. These ocelli placed, two near apex, and four in linear order from anal angle, the lower pair often geminated, the striation distinct

a². Upperside with two subanal ocelli on the hindwing.

207. *Y. AVANTA*, Western Himalayas, Tenasserim

b². Upperside with three subanal ocelli on the hindwing.

208. *Y. ORDINATA*, Bengal.

Of this group *Y. philomela* is the most widely spread as well as the most variable species in the genus, and is the only one that occurs in South India. *Y. motschulskii* is very similar in appearance to *Y. nasada* and its allies in the second group, the ocelli in these appear to be remarkably constant. *Y. avanta* and *Y. ordinata* most nearly resemble *Y. singala* and *Y. thora*; and the nearest approach to *Y. indecora* in the second group appears to be in *Y. mica*.

202. *Ypthima motschulskii*, Bremer, Grey.

Batyus motschulskyi, Bremer, Grey, Beitr zur Schmett fauna nordl. China's, p. 8, n. 26 (1853); *S. motschulskii*, Ménétries, Enum. Corp. Anim., pt. 1, p. 47, n. 787, pl. vi, fig. 5 (1855); *Ypthima motschulskii*, Hewitson, Trans. Ent. Soc. Lond., third series, vol. 11, p. 290, n. 17 (1864).

HABITAT: North India, Khasi Hills, China.

EXPANSE: 1.55 to 2.00 inches.

DESCRIPTION: "UPPERSIDE fuscous; each wing with a single ocellus. UNDERSIDE cineraceous, densely undulated with rufous. Hindwing with three ocelli."

"Very near to *Y. pandorus*, but differs from it on the upperside in having the iris of the forewing slightly divided; and in having one ocellus only on the hindwing. UNDERSIDE undulated throughout, and with the apical ocellus of the hindwing larger, and bears a great resemblance to *Y. nasada* except in colour." (Hewitson, l.c.)

There is a species of *Ypthima* which occurs in Shillong, and which we for the present identify under this name; chiefly because a variety of *Y. motschulskii* from North India is mentioned by Mr. Butler in the Catalogue of the *Satyrina* in the British Museum (p. 148); it is at once distinguished from all other species having only three ocelli on the underside of the hindwing, by the presence of a sexual brand on the forewing of the male placed along either side of the median nervure, which though concolorous with the rest of the wing, is easily seen on holding up the insect against the light, owing to the much greater density of the clothing of scales; the UPSERIDE is more uniform in colour than in *Y. nareida* and its allies, with no trace of a dark submarginal line, and the colour is more fuliginous. On the UNDERSIDE too the colour is quite uniform rufous brown, covered throughout very finely and densely with cinerascens-ochreous striae, with no bands or patches of any kind free from striation; the ocelli are as in *Y. nareida*, but rather smaller. The forewing is more triangular and the outer margin less convex than in *Y. nareida*.

Typical *Y. motschulskii*, as figured by Menetries from Pekin, has the underside clouded with whitish, especially on the hindwing as in *Y. pandocus*, but it, as well as the Indian variety here described, differs from *Y. pandocus* in having only a single ocellus on the upper side of the hindwing, and further in having the ocellus on the upperside of the forewing geminated rather than bipupilled. The Indian specimens measure 1.55 inches in expanse.

We have only as yet received specimens from Shillong, where it has been taken by Dr. E. R. Johnson in March, April, May and July, who writes that "it flies faster than *Y. newara*, frequents more open spaces, and is rather uncommon," the FEMALE flies in May, and is somewhat larger, paler, and on the UPSERIDE with traces of the whitish striation so conspicuous in *Y. newara*, on the underside it is equally uniform in colour and striation as the male, but the striation is coarser and the ocelli are larger.

203 *Ypthima methora*, Hewitson.

Ypthima methora, Hewitson, Trans. Ent. Soc. Lond., third series, vol. II, p. 291, n. 19, pl. xviii, figs. 20, 21 (1864), female.

HABITAT North India, Upper Burma.

EXPANSE 2 inches.

DESCRIPTION. "FEMALE UPSERIDE brown, undulated with grey towards the outer margins, the outer margins and *cilia* rufous brown, traversed by a grey line. Forewing with one very large two pupilled ocellus on both sides. Hindwing with five ocelli, all black, with pupils dull silver, with nides rufous, narrow. UNDERSIDE grey, closely undulated throughout with rufous-brown. Both wings crossed at the middle by a curved rufous band. Hindwing with six ocelli in pairs; the pupils of bright silver, the nides orange-yellow. Nearest to *Y. sakra*, but of very different aspect." (*Hewitson*, l. c.)

The only distinctive feature in the above description is the single curved rufous band crossing both wings on the under side. There are three males in the Indian Museum, Calcutta, taken by the Yunnan Expedition which, allowing for the difference in sex, correspond well with Hewitson's figure of this species. They are over two inches in expanse (2.1 to 2.2), and are distinct from *Y. philomela*, aberrant specimens of which sometimes equal them in size; but they belong to the same group, and have a distinct sexual mark on the forewing. They are more rufous in tone than *Y. philomela*; the striation of the underside is much more uniform and bolder; and the subbasal fascia is entirely absent, the submarginal scarcely traceable, and the median one alone distinct, but even that not so distinct as in *Y. philomela*.

Further, although Hewitson in his original description describes the ocelli of the upper side of the hindwing as pupilled with dull silver, in his figure, and also in all the three specimens in the Indian Museum, they are entirely blind, though large and prominent, and this seems in reality the most striking feature of the species.

An apparently allied species, of which the female alone is known, has been described from the Malay peninsula.*

204. *Ypthima philomela*, Johanssen.

Papilio philomela, Johanssen, Amœn. Acad., vol. vi, p. 404, n. 60 (1764); *Papilio philomelus*, Linnæus, Syst. Nat., vol. i, pt. ii, p. 768, n. 103 (1767); *Papilio baldus*, Fabricius, Syst. Ent., Appendix, p. 809 (1775); id., Donovan's Ins. Ind., pl. xxxvi, fig. 2 (1800); *Satyrus baldus*, Godart, Enc. Méth., vol. ix, p. 551, n. 184 (1819); *Ypthima baldus*, Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, p. 286, n. 9 (1864); *Papilio lava*, Donovan (nec Linnæus), Nat. Rep., vol. ii, pl. lxxi (1834); *Ypthima laroides*, Westwood, Gen. D. L., vol. ii, p. 395, n. 6 (1851).

HABITAT: India, Burma, Java, Sumatra, China.

EXPANSE: 1.35 to 2.30 inches; usually about 1.6 inches.

DESCRIPTION: MALE: UPPERSIDE brown. *Forewing* with one bipupilled ocellus. A broad streak of darker scales extending widely on both sides of the median nervure. *Hindwing* with from two to six ocelli. UNDERSIDE whitish, undulated throughout with brown, with three brown fasciæ, one submarginal, one discal and one subbasal, the latter sometimes indistinct. *Forewing* with one bipupilled ocellus. *Hindwing* with six placed in pairs in echelon. FEMALE: UPPERSIDE paler, with a broad submarginal nebulous band of whitish stræ on which the ocelli are placed, and which is defined inwardly and outwardly with a dark line, otherwise marked as in the male; the male also has traces of this nebulous band, but it is far less distinct.

Y. philomela has a very wide range, and is perhaps the most variable species of the genus; it has not been recorded from Ceylon, but it is found not uncommonly in the Ashamboe hills in Travancore in the extreme south of the peninsula, and through the Wynaad along the Western Ghâts as far as Khandalla; we have no certain record of its occurrence on the east coast or in the Deccan, though it probably will be found in suitable localities throughout the peninsula and Central India; we have specimens from Manbhoom and Orissa, and in Lower Bengal, Eastern Bengal, and Assam it is one of the commonest species. In the Himalayas also it is found as far west as Chumba, and probably throughout the range eastward; in Sikkim it is not uncommon; it is found in the Khasi and Naga hills, Cachar, and in Arakan, Pegu and Tenasserim, and extends to Java. Mr. Distant does not mention it in his "Rhopalocera Malayana," but he appears to have figured and described it under the name *Y. methora* (p. 56, pl. vi, fig. 9, 1882).

The ocelli of the UNDERSIDE of the *hindwing* vary greatly in size and prominence, being sometimes almost entirely obsolete; when large each pair is coalescent, when small, all are well separated, but wherever they can be discerned the arrangement in pairs in echelon is distinct; occasionally a seventh minute ocellus appears below the lower discoidal nervule. On the UPPERSIDE of the *hindwing* the pair of ocelli on the median interspaces is always present (except in a single specimen from Tenasserim in which the upper one is wanting) and prominent, the upper and lower pairs are extremely variable, in some all four are present, and in these cases the ocellation of the upperside corresponds in arrangement with that of the underside; in others almost every variation is presented, every combination from two to six ocelli being represented. On the upperside of one *forewing* only in a female specimen from

* *Ypthima newboldi*, Distant. HABITAT: Province Wellesley. EXPANSE: female, 1.65 inches. DESCRIPTION: "UPPERSIDE pale brown. *Forewing* with a large subovate paler fascia, placed transversely on apical half, and on which is a large black ocellated spot, with a yellow margin and with two small bluish talc-like eyes; this spot is placed a little beyond end of cell, its upper margin extending a little above first discoidal nervule, and its lower margin reaching the second median nervule. *Hindwing* with a broad pale submarginal fascia, on which are three ocellated black spots, with yellow margins and bluish talc-like eyes, the first and smallest of which is placed between second subcostal and discoidal nervules, and the other two, which are largest and placed close together, are situated nearer to the posterior margin, and between the median nervules. UNDERSIDE pale greyish, mottled with brown; ocellated spots as above, but *hindwing* having two additional smaller ones placed close together near anal angle, between third median nervule and submedian nervule and the small spot, as seen above, much larger beneath. Allied to *Y. methora*, Hewitson, but differs in having five instead of six ocellated spots on the underside of the *hindwing*, which have also a different and more unicolorous hue." (Distant, Ann. and Mag. Nat. Hist., fifth series vol. ix, p. 306 (1882), 1 c.; idem, id., Rhop. Malay, p. 25, n. 3, pl. iv, fig. 6 (1882), female.)

Shillong, but on both wings on the underside; and in another female from Calcutta, on both wings on both sides, there is a small ocellus in the first median interspace.

Specimens from the Western Himalayas are the smallest and darkest, usually only the median pair of ocelli is present on the UPPERSIDE, which in them closely resembles that of *Y. indecora*; occasionally one of the upper pair is present, making three in all, and sometimes one of the lower pair appears; on the UNDERSIDE the ocelli are usually prominent, large, each pair coalescing; the striation is darker and the subbasal fascia is indistinct. Specimens from Sikkim are usually rather larger and paler; the UPPERSIDE shows greater variation in the ocellation; sometimes the upper pair is present and the lower entirely wanting; sometimes the lower pair is present and the upper wanting. In the plains of Lower and Eastern Bengal, Sylhet and Assam the colouration is paler still; all six ocelli are frequently present on the UPPERSIDE of the hindwing, especially in the females, but the most common form has five ocelli, the uppermost of the upper pair alone being obsolete; on the UNDERSIDE the ocelli are smaller, distinct, and all well separated; frequently they are minute and in some barely traceable. In our specimens from Shillong this feature is most developed; in scarcely a single specimen of the spring brood are the ocelli prominent, and in many they are for the most part obsolete on the underside, while on the upperside they are darker and usually with only the median pair of ocelli present on the hindwing; these latter are almost indistinguishable from *Y. indecora*; the July brood closely resembles specimens from Sikkim. These two distinct variations are also shewn in specimens taken by Dr. Anderson in the Mergui archipelago during the cold weather. Specimens from the Western Ghâts and hills of South India are intermediate between the Sikkim and Shillong forms; the ocelli are usually small or minute but distinct; specimens from Akyab correspond with those from Sikkim; but in Tenasserim the greatest variation is found in depth of colouration, in ocellation, and above all in size. A MALE from the Meplay valley measures two inches in expanse; the upperside is silky mouse-brown, the nebulous band distinct on the hindwing, barely discernible on the forewing, the apical pair of ocelli are prominent on the hindwing, while the subanal pair is represented by a single minute blind ocellus; the underside is very pale buff, the striation is pale and fine, and the fasciæ are prominent and dark, especially on the forewing; the ocelli of the hindwing are distinct but minute and well separated; and a FEMALE from the lower Thoungyeen forests is dark brown, the nebulous fasciæ prominent on both wings, the median pair of ocelli on the hindwing very large and prominent, with a single apical and a single subanal ocellus small and less distinct; on the UNDERSIDE the striation is bold and dark, the fasciæ prominent, the ocelli of the hindwing very large, each pair with the irides completely coalesced and encircled by a single dark outer line, the subanal pair being geminated.

Y. philomela is found in the Western Himalayas in July; in Sikkim from July to December; in Shillong in March, April and May, and again in July; in Lower and Eastern Bengal it is very common from May to July, and again in November, and probably throughout the year; in Cachar Mr. Wood-Mason took it in profusion from April to October; from Arakan, Pegu, Tenasserim, and the Mergui archipelago, we have specimens taken in all months from October to March; specimens from Khandalla and the Coessi Ghât in the South Konkan were taken by Mr. G. Vidal at the end of March; and from Travancore by Mr. Harold Fergusson at 2,000 feet elevation in March and April.

205. *Ypthima marshalli*, Butler.

Y. marshalli, Butler, Ann. and Mag. of Nat. Hist., fifth series, vol. 2, p. 373 (1882).

HABITAT: Upper Tenasserim.

EXPANSE: 1·65 inches.

DESCRIPTION: "UPPERSIDE brownish grey; basal area more dusky than the external area. Forewing with a large oval subapical black ocellus, bipupillated with silver, and with dusky-bordered pale straw-coloured iris; an ill-defined submarginal dusky line. Hindwing crossed beyond the middle by an oblique subangulated indistinct dusky line; a small blind ocellus on the second subcostal interspace; two large round unipupillate ocelli on the

median interspaces, and two minute blind ocelli placed transversely near the anal angle; a wavy dusky submarginal line; base and an abdominal streak dark grey. *Body* blackish. *UNDERSIDE* whitish stone-brown, finely reticulated with grey; crossed in the middle by two subparallel dusky stripes, those of the forewing more distinct and tinted with yellowish; disc of forewing whiter than the rest of the surface; ocellus as above. *Hindwing* with all the ocelli very minute; an additional punctiform ocellus on first subcostal interspace."

"Allied to *Y. methora*; similar in shape. It appears to be quite constant." (*Butler*, l. c.)

The type specimen, which was taken by Capt. C. T. Bingham at Meplay in the Thoungyen valley in March, is in the British Museum.

This species is, of course, distinct from *Y. methora*, but we are unable to detect a single character by which it may be separated from *Y. philomela*, specimens of which from the same locality agree with this in every particular, except perhaps the presence of a dark grey abdominal streak, but a dark grey streak on a dusky brownish-grey ground is not easy to trace. No mention is made of the presence or absence of a male sexual streak on the forewing.

206. *Ypthima indecora*, Moore.

Y. indecora, Moore, Proc. Zool. Soc. Lond., 1882, p. 238, pl. xli, fig. 7.

HABITAT: Western Himalayas.

EXPANSE: ♂, 1·25 to 1·50; ♀, 1·37.

DESCRIPTION: "Nearest to *Y. inica*, Hewitson. *UPPERSIDE* brown. *Forewing* with a darker subbasal oblique shade; a prominent, bipupilled, subapical ocellus. *Hindwing* with two smaller subanal ocelli. *UNDERSIDE* covered with very slender grey strigæ; two very faint brown fasciæ crossing middle of *both wings*, those on the *hindwing* waved. *Hindwing* with two subapical and three subanal, extremely minute, and indistinct silver-pupilled ocelli." (*Moore*, l. c.)

Y. indecora is really most nearly allied to *Y. philomela*; from *Y. inica* it is distinguished by the presence of the sexual streak in the forewing of the male, and by the invariable presence of two subanal ocelli on the upperside of the hindwing, *Y. inica* having no sexual streak, and only a single ocellus on the upperside of the hindwing. From *Y. avanta*, which is found in the same localities in the Western Himalayas, it differs on the upperside in having the ocellus of the forewing large, bipupilled, with distinct yellow iris, and the two on the hindwing each with a single silvery pupil, in these respects corresponding with *Y. ordinata*, and in two specimens that we possess there is a third anal ocellus on the hindwing, making the resemblance to *Y. ordinata* complete; but on the *UNDERSIDE* it is widely different from both; the ocelli of the *hindwing* when visible are arranged as in *Y. philomela*, but they are always exceedingly minute, and in a large majority of specimens are totally absent; the striation is much less distinct, and the fasciæ are more diffused and tinged with ochraceous. In two male specimens on the upperside of the hindwing there is a moderate-sized ocellus above the discoidal nervule. The *FEMALE* has the *forewing* broader and more rounded at the apex, the ground-colour above and below paler, and on the upperside is decidedly mottled, and lacks the sexual streak of the male on the forewing.

Typical *Y. indecora* appears to be confined to the Western Himalayas, where it has been taken in Pangi, Kulu and Kangra, in April and July. But some varieties of *Y. philomela* in the east and south, in which the subanal ocelli of the upperside of the hindwing are obsolete, and those of the underside minute or obsolescent, approach it very closely indeed, so much so that it is almost impossible to distinguish to which species these varieties belong.

207. *Ypthima avanta*, Moore. (PLATE XVII,* FIG. 66 ♂).

Ypthima avanta, Moore, Proc. Zool. Soc. Lond., 1874, p. 264, fig. 66.

HABITAT: Western Himalayas, (var.) *Y. avanta*.

EXPANSE: 1·25 to 1·50 inches; var. 1·70 inches.

* Erroneously named *Y. ordinata* on the plate

DESCRIPTION : "UPPERSIDE dark brown, with an indistinct bipupilled ocellus on the forewing, and two subanal ocelli on the hindwing. UNDERSIDE grey, numerously covered with dark brown narrow strizæ, and crossed with three brown fasciæ, the subbasal one being indistinct. Forewing with a bright oval ocellus bipupilled with silver. Hindwing with seven small prominent silver-pupilled ocelli, the upper third minute, the two anal geminated." (Moore, l. c.)

Y. avanta closely resembles *Y. singala* on the upperside, but has a sexual patch on the forewing of the male, which *Y. singala* lacks. On the underside the ocellation too is somewhat similar, but *Y. singala* almost always lacks the transverse dark fasciæ, which in *Y. avanta* are conspicuous. From *Y. indra* it differs on the upperside in having the ocelli of the hindwing blind, and that of the forewing small, very indistinct, sometimes quite obsolete; and on the underside in having the ocelli distinct (though varying in size in different specimens), and always prominently pupilled with silver. From *Y. philomela* it is distinguished by the four lower ocelli on the underside of the hindwing being arranged in linear order, not in pairs in echelon.

The specimen described originally by Mr Moore with, on the underside of the hindwing, "seven ocelli, the upper third minute," was evidently an aberrant form, for among all the numerous specimens we have seen, the seven ocelli appear in only a single one; all the rest have the minute upper third ocellus entirely wanting. Similar aberrations occur in *Y. philomela*, in which specimens with seven ocelli are even less uncommon. The FEMALE differs from the male only in having the wings rather broader; on the UPPERSIDE no sexual patch on the forewing, and the ocellus of the forewing more prominent and distinctly circled with yellow, and on the UNDERSIDE in the single typical specimen we have seen the ocelli are larger with wider yellow irides, the strization is somewhat coarser, and the subbasal fascia is less distinct. The size of the ocelli in the male also differs widely; in some they are minute with very narrow irides, in others large, with wide yellow irides.

Y. avanta is found in the Western Himalayas from April to August, being common in Kulu and extending to Kashmir on the west, and to Sikkim on the east.

A variety of this species has been taken in Tenasserim by Captain C. T. Bingham, which is considerably larger, 1.7 inches in expanse, the MALE is on the upperside slightly more fuliginous in colour, and the ocellus of the forewing is represented by a single indistinct dark spot; on the UNDERSIDE it is slightly paler and the ocelli of the hindwing are very minute. The FEMALE is paler on the UPPERSIDE, with the ocellus of the forewing prominent, bipupilled, and with distinct yellow iris, and the two on the hindwing each with a single pupil; there is also on both wings a distinct indication of the broad nebulous submarginal band defined at both edges with darker lines which is so prominent in females of *Y. philomela*. The UNDERSIDE is as in the male, but still paler. The MALE was taken in the lower Thoungyeen forests in May, and the FEMALE in the Donat Range in January.

The figure (named erroneously *Y. ordinata* on the plate) shows the upper and undersides of a male specimen from Kulu, in the Indian Museum, Calcutta. In it the ocellus of the upperside of the forewing is rather more distinct than is usual, and the pupils of the ocelli of the underside of the hindwing, which are silvery and prominent, have unfortunately not come out in the plate, these ocelli are also larger in this specimen than in typical ones, though we have other examples with the ocelli twice as large.

208. *Pythima ordinata*, Butler.

Y. ordinata, Butler, Proc. Zool. Soc. Lond., 1880, p. 248, pl. xv. fig. 3.

HABITAT : Berigal.

EXPANSE : 1.4 inches

DESCRIPTION : "Nearly allied to *Y. singala*, rather darker. UPPERSIDE : Forewing with the ocellus less widely zoned. Hindwing with three ocelli in an oblique decreasing series from third median branch to anal angle. UNDERSIDE decidedly browner, the transverse

stripes less prominent. *Hindwing* with six ocelli, forming a regular but interrupted series, two at apical angle, and two on median interspaces of nearly equal size, and two smaller, unequal and confluent at the anal angle; all these ocelli have a single small plumbeous pupil." (Butler, l.c.)

The habitat given for *Y. ordinata*, "Bengal," which may mean anything from Kashmir to Orissa, is too vague to afford any clue as to its affinities. In Butler's figure of *Y. ordinata* the underside is indistinguishable from our figure of *Y. avanta*, Plate XVII, fig. 66 (erroneously named *Y. ordinata* on the plate), except that in Butler's figure the cell of the forewing is shorter, the disco-cellulars less oblique and defined by a brown litta; the figure of the upperside has the ocellus of the forewing much more prominent, with distinct yellow iris, and on the hindwing there is a third anal ocellus in a line with the other two.

The ocelli on the underside of the hindwing are prominent, and arranged precisely as in *Y. avanta*, but on the upperside the presence of the third ocellus on the hindwing is the character which apparently should distinguish it. We have a single specimen taken in the Sikkim tara in July, in which this third ocellus is minutely present, and which should be *Y. ordinata*, but it is indistinguishable from some specimens of *Y. avanta* in which the ocelli of the underside are large.

Key to the Indian species of Ypthima

Second Group

B. Males without the patch of densely packed scales along the median nervure on the upperside of the forewing.

a. *Underside* of the hindwing with three ocelli, placed one near the apex, two near the anal angle.

a¹. These ocelli large ground colour uniform ochreous, densely striated with brown, forewing with the submarginal brown fascia wide at inner margin.

209 *Y. NAKEDA*, Western Himalayas

a². These ocelli larger and brighter ground-colour whiter on hindwing, the striation bolder, forewing with the submarginal fascia even throughout.

210 *Y. NEWARA*, Eastern Himalayas, Khasi Hills, Assam.

a³. These ocelli smaller ground colour much clouded with white striation irregular in density, forewing with submarginal and median fasciæ more or less distinct

211 *Y. PANJOCUS*, North India, Burma, Java

Y. CORTICARIA, Malacca

a⁴. These ocelli variable in size, ground-colour uniform whitish, striation uniform, no fasciæ on the hindwing

212 *Y. ARIASPA*, Central India, Punjab

a⁵. These ocelli usually minute, forewing with the ocellus with a dark outer zone, below which is a rufous space devoid of undulations.

213 *Y. ASTEROIE*, Western Himalayas, Central India, Bombay.

b. *Underside* of the hindwing with no trace of ocelli.

a¹ Hindwing with four irregular clouded interrupted bands on the underside, and only a single ocellus on the upperside

214 *Y. INICA*, Central India.

a² Hindwing distinctly striated on the underside, the striation not uniform in density, but with no fasciæ, no ocelli on the upperside. Forewing with dark outer zone to the ocellus, but the rufous space below undulated.

215 *Y. NARASINGHA*, Sikkim.

c. *Underside* of the hindwing with four ocelli placed in pairs, two near apex and two near anal angle.

216 *Y. NYAGRIYA*, Himalayas.

d. **UNDERSIDE** of the hindwing with four ocelli placed one near apex, and three in a line from the anal angle, the anal one bipupilled or geminated, sometimes divided, making five ocelli altogether.

a¹. The three lower ocelli not placed on a complete dark fascia, the anal one bipupilled.

a². Both wings brown.

217. Y. **MUSENERI**, India, Burma, Malaya.

a¹. The lower half of the hindwing pure white.

218. Y. **CEYLONICA**, Ceylon, Madras, Orissa.

b¹. The three lower ocelli placed on a complete dark fascia, the subanal one geminated, sometimes divided, making five ocelli altogether.

a². The fasciæ of both wings converging towards the hinder angle.

219. Y. **CHENUI**, Nilgiris.

b². The fasciæ subparallel.

a³. Hindwing greyish, the striation not uniform; the fasciæ prominent.

220. Y. **ROBINSONI**, Palni Hills.

b³. Dark brown throughout; the striation very faint; the fasciæ indistinct, irides obsolete.

221. Y. **YPTHIMOIDES**, Ashamboo hills.

UNDERSIDE of the hindwing with four to six ocelli, typically six in pairs, but one or two often obsolete.

a¹. These ocelli in linear order, the ground-colour greyish white.

a². The fasciæ of the underside very indistinct or obsolete.

a³. Upperside with the ocellus of the forewing obsolete; underside with the ocelli well formed and distinct.

222. Y. **SINGALA**, Ceylon, Central Provinces, North-West Himalayas.

b⁴. Upperside with the ocellus of the forewing prominent, underside with the ocelli minute on the hindwing.

223. Y. **THORA**, Ceylon.

b⁵. The fa cie of the underside distinct, prominent, the ocelli all very prominently pupilled with silver.

224. Y. **BOLANICA**, Beluchistan.

These ocelli in irregular order, the apical and anal pair geminated, the median distinct, the ground colour ochreous, uniformly and densely striated; the fasciæ indistinct or wanting.

a². The apical pair of ocelli completely coalescing, not divided by a yellow iris.

225. Y. **SAKRA**, Himalayas, Khasi and Naga hills.

b⁶. The apical pair of ocelli geminated but divided by the yellow iris.

226. Y. **NIKARA**, Western Himalayas.

c². Of very small size, otherwise closely resembling Y. *sakra*.

227. Y. **TABELLA**, The Wynnad.

209. **Ypthima nareda**, Kollar. (PLATE XVII, FIG. 63 ♂).

Batyris nareda, Kollar, in Hügel's Kaschmir, vol. iv, pt. ii, p. 451, n. 12 (1844). *Ypthima nareda*, Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, p. 284, n. 6, pl. xvii, fig. 6 (1864), male.

HABITAT: Himalayas.

EXPANSE: 1.45 to 1.70 inches.

DESCRIPTION: "Wings entire. **UPPERSIDE**, fuscous, both wings with a single black ocellus with yellow iris, bipupilled in the forewing. **UNDERSIDE** undulated with yellowish; hindwing with three ocelli." (Kollar, l. c.)

This is the common species of the Western Himalayas. The MALE insect has no sexual patch on the wings; and the FEMALE only differs by its slightly paler colouration, rather larger ocelli, and broader more rounded wings. On the UPSIDE the outer margin is slightly paler than the rest of the wings, and bears an indistinct dark submarginal line, less distinct on the hindwing. On the UNDERSIDE there is a rufous brown submarginal band on the forewing, narrow at the apex and wide at the inner margin; all the rest of the wing being rufous brown, closely and delicately undulated with yellowish strizæ; the ocelli are large, black, with bluish-silver pupils, and yellow iris, bordered with a narrow outer ring of brown; that on the forewing is subapical, oblong, and bipupilled, those on the hindwing are rounded, one subapical large, and two subanal smaller, the lower of the two latter the smallest, and sometimes bipupilled. Hewitson remarks that the anal ocellus is bipupilled in the female, but his figure of the female belongs to the next species, *Y. newara*, and the bipupillation of the anal ocellus in *Y. narenda* occurs casually in both sexes.

Y. narenda, as here restricted, appears to be found only in the Western Himalayas, being replaced in the East by the next species, *Y. newara*. It occurs at from 6,000 to 8,000 feet elevation in suitable localities throughout the Western Himalayas, and is not uncommon. We have specimens from Kashmir taken in June at 8,200 feet elevation; from Pangi and Kulu taken in May and July; and from the neighbourhood of Simla in July; it also occurs at Mussoorie and probably in Kumaon.

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

210. *Ypthima newara*, Moore.

Ypthima newara, Moore, Proc. Zool. Soc. Lond., 1874, p. 567; *Y. narenda*, Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, pl. xvii, fig. 7 (1864), female.

HABITAT: Nepal, Sikkim, Assam, Cachar, Upper Burma.

EXPANSE: 16 to 20 inches.

DESCRIPTION: "MALE: UPSIDE brown. Forewing with a single subapical ocellus. Hindwing with two subanal ocelli, the former bipupilled, and the latter with a single pupil of bright blue. UNDERSIDE yellowish grey, partly covered with numerous short brown strizæ; both wings with a narrow submarginal brown fascia. Forewing with a single bipupilled ocellus as above. Hindwing with three ocelli, the apical one very large, the anal bipupilled, the other one with a single bright blue pupil. FEMALE: UPSIDE brown, externally with short pale strizæ, both wings with a single ocellus. UNDERSIDE as in the male."

"Differs from *Y. narenda*, Kollar, in being somewhat larger, the female striated above, the ocelli of both sexes much larger on the underside, and the position of the ocellus on the forewing being less inwardly oblique." (Moore, l. c.)

Specimens of *Y. newara* from Sikkim are very distinct, but the Nepal race on which the species is founded seems to approximate to *Y. narenda* far more than the Sikkim race does; and it is not improbable that this may be merely a geographical variety of *Y. narenda* which it replaces in the Eastern Himalayas. The whitish strizæ on the UPSIDE of the female which cover the outer half of both wings form a well-marked character, and on the UNDERSIDE the very large and brightly coloured ocelli in both sexes, and the even character of the brown submarginal band not widening out below the ocellus, as well as the much bolder striation of the rest of the wing serve to distinguish it.

The second subanal ocellus on the upperside of the hindwing is not constant in the male, and it more frequently occurs in the female, being a casual not a sexual variation. There is no sexual patch in the male.

We have specimens of *Y. newara* from Nepal; from Sikkim taken by Messrs. Otto Möller and de Nicéville in October at about 3,000 feet elevation; from Sibsagar in Upper Assam; from Shillong in the Khasi Hills taken by Dr. E. R. Johnson in May and July; from Cachar taken by Mr. Wood-Mason in May and July; and others brought by the Yunnan Expedition.

211. *Ypthima pandocus*, Moore.

Ypthima pandocus, Moore, Hornfield and Moore, Cat. Lep. E. I. C., vol. i, p. 233, n. 306 (1857); id., Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, p. 290, n. 16, pl. xviii, fig. 12 (1864); *Ypthima pandocus*, Butler, Cat. Lep. B. M., *Satyridae*, p. 149, n. 5 (1868).

HABITAT: N. India, Mergui, Java.

EXPANSE: ♂, 1.5; ♀, 1.75 inches.

DESCRIPTION: "Wings fuscous. Forewing on both sides with one ocellus. Hindwing with two on the upperside. UNDERSIDE whitish, clouded and undulated with rufous. Hindwing with three ocelli." (Hewitson, l. c.) The original description by Moore, which is appended for reference, * is of little use, as it is given in comparison with a species from China with which it has but little affinity; the description, moreover, is certainly meagre and apparently inaccurate, for no *Ypthima* that we are acquainted with has only two ocelli on the underside of the hindwing, unless it be by accidental or varietal obliteration of one or more; and two of the original specimens of *Y. pandocus* from the East India Museum are now in the India Museum, Calcutta, and have three (not two) ocelli, as correctly described by Hewitson.

The types of *Y. pandocus* are from Java, they have on the upperside a submarginal dark line within which is an obsolete paler band on which the ocelli of both wings are placed. The underside differs from that of all others in this group by having the ground-colour partially whitish, and the density of the striation very irregular, so that large patches of whitish almost free from striation are left, especially on the hindwing; they are over one and a half inches in expanse.

We have seen nothing from North India agreeing altogether with the types, but we have several specimens, among them one from the old East India Museum collection, labelled "India" and named *Y. pandocus*, agreeing fairly well in colour and markings though very much smaller, barely over an inch in expanse. *Y. pandocus* may be distinguished from *Y. asterops*, the only other species with similar ocellation of the hindwing with so small an expanse, by the greater prevalence of whitish on the underside of the hindwing; and by the absence of the outer brown ring to the ocellus on the underside of the forewing. Besides the specimen labelled "India" referred to above, we have others taken at Baranackpore in November, and at Mergui in March.

An allied species or variety from Malacca has been described by Butler under the name of *Y. corticaria*, it is redescribed and figured by Distant, but we are unable to discover in what way it is supposed to differ from *Y. pandocus*. Distant's remarks (Rhop. Malay., p. 56, 1882) show that the ocelli in this species are variable, which is borne out by the North Indian examples of *Y. pandocus*, and other allied species, the second subanal ocellus on the upperside of the hindwing is often found in *Y. newara* and sometimes in *Y. nereda*.

* *Ypthima pandocus*, Moore. DESCRIPTION: "UPPERSIDE as in *Ypthima lysandra*, but with only two ocelli on the hindwing, the lower ocellus being at the anal angle and very small. UNDERSIDE with the hindwing having only two ocelli." (Moore, l. c.)

† *Ypthima corticaria*, Butler, Trans. Ent. Soc. Lond., second series, vol. i, Zoology, p. 537 (1876); idem, id., Distant, Rhop. Malay., p. 55, pl. vi, fig. 8 (1882). HABITAT: Malacca. EXPANSE: 1.7 inches. DESCRIPTION: "UPPERSIDE. Both wings greyish brown, an inner submarginal streak and an outer submarginal line, blackish, diffused. Forewing with a large subapical oval black ocellus, with two plumbeous pupils, and a testaceous iris surrounded by a dusky line, a similar smaller unipupillated rounded ocellus near anal angle of hindwing. UNDERSIDE. Both wings white, densely reticulated with brown, two ill defined, interrupted, central, subparallel lines, a submarginal streak and line as above. Forewing with the ocellus brighter and better defined than above, outer border pale brown, bounded by the inner submarginal streak. Hindwing with three ocelli, one at apex (below which is sometimes another extremely small ocellus), and two placed obliquely at anal angle, the lower one small and irregular. Allied to *Y. nereda*." (Butler, l. c.)

In Rhop. Malacca, Mr. Distant remarks: "This species also exhibits the inconsistency of ocellated macular markings. In the type specimen described by Butler there was only one spot on the upperside of the hindwing near the anal angle, whilst on the underside the duplex one of the specimen here described was single. In another Malaccan specimen in the British Museum there is a fourth very small ocellated spot below the one at apex."

212. *Ypthima ariaspæ*, Moore*Ypthima ariaspæ*, Moore, Proc Zool Soc Lond, 1874, p. 568

HABITAT: Punjab, Central India.

EXPANSE: 1'1 to 1'4 inches.

DESCRIPTION: "MALE: UPPERSIDE dark brown *Forewing* with a subapical bipupilled ocellus. *Hindwing* with a small subanal ocellus. UNDERSIDE whitish grey, with numerous narrow brown uniform prominent strigæ. *Forewing* with the ocellus as above. *Hindwing* with a single large subapical ocellus, and two smaller ocelli from anal angle."

"This species is similar in appearance to *Y. narada*; the ocelli of the upperside are smaller, the ground-colour of the underside being much paler, more uniformly covered with strigæ, and without transverse brown fasciæ" (Moore, l. c.)

We have only seen *Y. ariaspæ* at present from Mhow in Central India, where it was taken by Colonel C. Swinhoe in May, and again in November. It differs from *Y. motschulskyi*, the only other species in which the underside is uniformly coloured and striated throughout, by having the underside whitish with brown strigæ coarser and prominent, instead of rufous brown with very fine yellowish strigæ, and more conspicuously by the male being entirely devoid of the sexual streak of the forewing. The tone of the upperside which is equally uniform is fuscous, not fuliginous. The wings are rounded as in *Y. narada*, but it is a smaller insect.

A small variety of this species has also been taken by Colonel Swinhoe at Mhow in November; it differs not only in size, but in its generally darker tone. On the underside the ground-colour is rufous-grey, rather than whitish-grey, but with the same uniform prominent brown strigæ; the ocelli of the underside are much smaller, minute in two, and scarcely visible in one specimen; and in one specimen the ocellus on the upperside of the hindwing is altogether absent.

213. *Ypthima asterops*, Klüg.

Hipparchia asterops, Klüg, Symb Phys., pl. xxix, figs 11-14 (1832). *Ypthima asterops*, Hewitson, Trans Ent Soc Lond, third series, vol. ii, p. 283, n. 1 (1864).

HABITAT: India, Java, China, Syria, Africa.

EXPANSE: 1'25 to 1'50 inches.

DESCRIPTION: UPPERSIDE. "Wings fuscous. *Forewing* with a single ocellus. UNDERSIDE cineraceous, undulated with rufous. *Hindwing* with three ocelli, pupilled with silvery" (Hewitson, l. c.). The ocellus of the *forewing* is of course present on the underside also, and has almost always two silvery pupi's. On the upperside the hindwing is sometimes immaculate, often with a single small subanal ocellus, and occasionally with three, the upper and lower very minute. The FEMALE is somewhat larger and paler coloured than the male, but its markings are similar.

"This species may be easily known from all others by the circular band of brown which passes round the ocellus on the underside of the forewing, as well as by a rufous space (sometimes clouded with brown), below the said circular band free from undulations. As will be seen from the localities quoted, it is widely distributed, and differs considerably in size. *Y. norma*, of Westwood, [Gen. D. L., vol. ii, pl. lxxvii, fig. 1, 1851], from China, I believe to be only a small variety of this species, darker, and wanting the ocellus on the upperside of the forewing; [*Hindwing* is evidently meant; Westwood's figure shows an ocellus on the upperside of the forewing, but none on the hindwing] there are similar varieties from the Holy Land. Specimens from Calabar and Natal do not differ from those of Europe [?], except in having the ring of brown which encircles the ocellus of the forewing more distinctly marked above, as in *Y. norma*, and in having the underside more clouded with rufous strigæ." (Hewitson, l. c.)

Y. asterops is a wide spread and somewhat variable species; the ocelli of the underside are smaller than in any other species with only three ocelli on the underside of the hindwing; often

minute, and sometimes scarcely visible, but the characters given above by Hewitson will always serve to distinguish it. It occurs in India in the Western Himalayas, and probably throughout Continental and Peninsular India in suitable localities. We have specimens from Chumba, Kussowli, Naini Tal, Sind, Khandesh, Nagpur, Mhow and Poona. Specimens from Chumba, taken in March by Major C. H. F. Marshall, are very dark in colour, the subanal ocellus on the upperside of the hindwing is prominent in all, and in one there is a smaller ocellus on each side of it, making three in all; the underside is uniformly striated on the hindwing, except in one specimen, which has a trace of a median rufous fascia. Specimens from Mhow, taken in May by Colonel C. Swinhoe, are paler and more whitish on the underside; and in all of them there is a trace, more or less distinct, of a median rufous fascia on the hindwing; the ocelli are very minute and in many of them scarcely traceable. Specimens from Poona, taken in October by Colonel Swinhoe, are typical, all having the ocelli minute but prominent, and only one or two showing a trace of the median rufous fascia on the underside. A single specimen from Hyderabad in Sind is a typical female; so are also two specimens from Amri and Ghindwara in the Central Provinces taken in October by Mr. J. A. Betham.

214. *Ypthima inica*, Hewitson.

Ypthima inica, Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, p. 284, n. 5, pl. xvii, fig. 3 (1864).

HABITAT: East India.

EXPANSE: 1·7 inches, Hewitson (about 1·4 in his figure), 1·1 to 1·3 inches.

DESCRIPTION: "UPPERSIDE rufous-fuscon, each wing with a single ocellus. UNDERSIDE cineraceous, undulated with rufous. Forewing with a single ocellus. FEMALE: UPPERSIDE rufous-brown, with a single ocellus on both wings. UNDERSIDE with rufous undulations throughout. Forewing with the ocellus as above. Hindwing without ocelli, clouded with darker colour."

"Closely allied to *Y. asterope*, but without the circular brown band which surrounds the ocellus on the forewing of that species, and also without the rufous space (devoid of undulations) near the anal angle." (Hewitson, l. c.)

The only precise record of the occurrence of *Y. inica* that we have received is from Lieutenant-Colonel C. Swinhoe, who writes that "it was very common at Mhow in Central India from November until March, when it was replaced by *Y. asterope*, which has been just as common ever since, but I have not captured a single *Y. inica* since the 20th March. I have also *Y. inica* from Paras Pani near Mirzapur taken in February." Not one of these specimens that we have seen come anywhere near the dimensions given by Hewitson (1·7 inches in expanse); they are all far smaller, ranging from 1·1 to 1·3 inches only in expanse; but they correspond well with the description, and some examples which were sent to the British Museum were identified by Mr. Butler as *Y. inica*, Hewitson; so that they may be accepted as *Y. inica* pending further research. These are, as Hewitson remarks, very closely allied to *Y. asterope*, and the fact recorded above by Colonel Swinhoe suggests the idea that they may be only the winter brood of that species. They are easily distinguishable from all other species in which the ocelli of the underside of the hindwing are entirely absent by the markings of that wing which on the underside has four irregular, interrupted, generally clouded and indistinct dark bands, the intervening spaces paler, and about the middle of the wing often washed with ochreous. The MALE of *Y. inica* has no trace of the sexual patch on the forewing. *Y. indecora*, which most nearly approaches it in the aspect of the underside, may be distinguished by its larger size, the presence of the sexual patch in the male, and of at least two ocelli on the upperside of the hindwing.

215. *Ypthima narasingha*, Moore.

Ypthima narasingha, Moore, Horsfield and Moore, Cat. Lep. E. I. C., vol. i, p. 236, n. 309 (1857); Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, p. 291, p. 22, pl. xviii, fig. 19 (1864).

HABITAT: Sikkim.

EXPANSE: 2 inches.

DESCRIPTION: "UPPERSIDE with only one ocellus on the forewing. UNDERSIDE greenish-grey, covered with short undulated darker striae, the one ocellus on the forewing

only, beneath which are two descending dark lines to posterior margin." (Moore, l. c.) "UPPERSIDE fuscous. Forewing with a single ocellus on both sides. UNDERSIDE cineraceous, undulated with rufous. Hindwing with minute white dots. The only species which has no ocelli on either side of the hindwing. On the underside some minute white spots occupy the place where in other species the ocelli are placed." (Hewitson, l. c.)

We have never seen this rare species, and are at a loss to recognise its affinities; the entire absence of ocelli from the upperside of the hindwing occurs in other species only in aberrant examples here and there, as in *Y. singala*. In Hewitson's figure (uncoloured) of the underside of *Y. narasingha* in the hindwing the striation is less dense at the outer margin, and again across the middle of the wing, giving a somewhat clouded appearance on the submarginal and basal areas; but besides the undulations there is no indication of any other markings whatever. On the forewing the dark line encircling the ocellus is remarkable; it is nearest to that of *Y. asterops*, but lacks the rufous space below devoid of undulations; the line starts from the inner edge of the ocellus to about the lower median nervule, where it is continued parallel to the inner margin, then sharply curving upwards continues parallel to the outer margin, disappearing before it reaches the costa, having a curiously quadrate appearance.

216. *Ypthima hyagriva*, Moore. (PLATE XVII, FIG. 64 ♀.)

Ypthima hyagriva, Moore, Horsfield and Moore, Cat. Lep. E. I. C., vol. i, p. 236, n. 567 (1857); id., Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, p. 291, n. 20, pl. xviii, fig. 11 (1864).

HABITAT: Himalayas.

EXPANSE: 1'5 to 1'9 inches.

DESCRIPTION: "UPPERSIDE with only two ocelli, one being at apex of the forewing, the other on the hindwing near the anal angle. UNDERSIDE yellowish. Hindwing covered with short narrow undulated striae, with two anterior and two posterior ocelli; a marginal line and submarginal streak blackish." (Moore, l. c.) "Easily known from all the other species by the broad submarginal line of brown on both sides, by the geminated oval ocelli near the apex of the hindwing, and the ochreous colour of the underside." (Hewitson, l. c.)

The UPPERSIDE is dark brown, slightly paler externally, and with a blackish submarginal line, obsolete in the male, but prominent in the FEMALE; the ocellus of the forewing is variable, sometimes rounded, with a single pupil, sometimes ovate with two pupils; the UNDERSIDE is ochreous brown, the submarginal line prominent in both sexes. The ocelli are large and prominent, black, with a single bluish-white pupil to each on the hindwing, broad yellow iris and dark outer line. The uniform colouring of the forewing on the underside (the hindwing only being striated), and the arrangement of the ocelli of the hindwing, a large geminated pair at the apex, and another large geminated pair at the anal angle, render this species notably distinct; the nearest approach to it being some aberrant examples of *Y. nikaa*. The male has no trace of the sexual patch on the forewing. *Y. hyagriva* was originally described from Darjiling, but we have only as yet received it from the Western Himalayas, where it does not appear to be common. Mr. A. Graham Young took it in the Kulu Valley in August and September.

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

217. *Ypthima hübneri*, Kirby. (PLATE XV II, FIG. 65 ♂.)

Y. philomela, Hübner (nec Linnaeus), Zutr. Ex. Schmett., figs 83, 84 (1818); *Ypthima philomela*, Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, p. 284, n. 4 (1864). *Ypthima philomela*, Butler, Cat. Lep. B. M., Satyrinae, p. 152, n. 18 (1868); *Y. hübneri*, Kirby, Syn. Cat. D. L., p. 95, n. 18 (1871); idem, id., Distant, Rhop. Malay, p. 57, pl. vii, fig. 5 (1882), female.

HABITAT: Peninsular and North India, Burma, Malay Peninsula, Sumatra, Java, Celebes.

EXPANSE: 1'2 to 1'5 inches.

DESCRIPTION: "UPPERSIDE fuscous; forewing with one ocellus; hindwing with two. UNDERSIDE whitish, undulated with rufous; forewing with one ocellus, hindwing with four,

placed one near the apex, and three together towards the anal angle; they are indistinctly pupilled with silver." (*Hewitson*, l. c.)

Y. huebneri is a very variable insect; typically the UPSIDE of the MALE is uniform rather pale fuliginous brown, with an indistinct dark submarginal line on both wings, and two ocelli on the hindwing, and one large bipupilled ocellus on the forewing. The UPSIDE of the FEMALE has two indistinct bands of whitish stræ on the forewing, one on either side of the ocellus meeting at the hinder angle, and continued on the hindwing as an indistinct submarginal pale band, and the ocellus of the forewing is larger with prominent yellow iris margined with brown. On the UNDERSIDE in both sexes the ocelli are typically prominent on both wings, the ground-colour is whitish, especially on the hindwing, finely but not very densely striated with rufous-brown; a marginal rufous line on both wings, a short line from the lower edge of the ocellus on the forewing; and a median fascia distinct on the forewing, but disappearing on the hindwing.

The variations of the UPSIDE, which are casual and common to both sexes, are as follows:—(a.) With the forewing immaculate; and again with great diversity in the size and prominence of the ocellus when present. (b.) With the hindwing immaculate. (c.) The hindwing with a single ocellus between the lower median nervules. (d.) The hindwing with a second ocellus between the upper median nervules. (e.) The hindwing with a third minute (sometimes geminate) ocellus at the anal angle. (f.) The hindwing with a fourth ocellus at apex, the ocellation in this case being similar to that of the underside.

The variations of the UNDERSIDE are in the ocellation of the hindwing, every gradation being found from prominent very black ocelli with minute silvery pupils, and wide pale ochreous irides, to minute dots, and in some cases no trace of ocelli whatever; and also there is a slight variation in the density of the rufous stræ, and in the prominence of the rufous fasciæ; where the ocelli are minute or obsolete, the striation is, as a rule, less dense, giving a paler, more whitish, tone to the whole, and at the same time the narrow rufous bands are more prominent, and on the hindwing the median band is more irregular.

In one very aberrant female specimen from Calcutta the yellow irides of the ocelli on the underside of the hindwing coalesce, forming a distinct yellow submarginal band, defined on both sides with a dark line, and bearing besides the usual four ocelli, a fifth and sixth, minute, placed one on each side of the discoidal nervule. In another female from Sibsagar the subapical ocellus is highly irregular in shape, having apparently two, if not three, other minute ocelli coalescing with it on its margin.

Where the ocelli of the underside are traceable, *Y. huebneri* can be distinguished from all others by their number and position, except from *Y. ceylonica*, *Y. chenii*, and *Y. robinsoni*. *Y. ceylonica* has the lower half of the hindwing pure white on both sides, and *Y. chenii* and *Y. robinsoni* have the rufous bands of the underside very broad and prominent, and the three subanal ocelli of the hindwing placed on the dark submarginal band.

Where the ocelli of the underside are indistinguishable on the hindwing, the species is not so easy to determine; from *Y. philomela* and its allies, *Y. ordinata*, *Y. indecora*, *Y. methora*, *Y. marshallii*, &c., it can be distinguished by the absence of the sexual patch on the forewing of the male; from *Y. narasingha* by its smaller size, and by the presence of the rufous fasciæ on the underside; from *Y. inica* by its larger size, whitish colour of the underside and comparatively uniform striation; and from *Y. asterope* by the absence of the large outer brown band encircling the ocellus on the underside of the forewing.

Y. huebneri is very common in the neighbourhood of Calcutta, throughout the year, and in Assam as far north as Sibsagar at any rate; and in both these localities every variation appears to be represented. We have specimens also from Manbhoom both with and without the ocelli on the upperside of the hindwing; and typical specimens from the Sikkim tarai taken by Mr. Otto Möller from July to September; also from Akyab taken in July; from Pegu taken in May and June, and from Gyne in Burma, taken by Captain C. H. E. Adamson in January. In these latter the male is typical, the female has the ocelli minute, and the rufous median

fascia prominent on the underside. Lieutenant-Colonel C. Swinhoe has taken a few specimens at Mahabaleshwar in May which are typical. Mr G. Vidal took numerous specimens in March on the Coessi and Onomed Ghâts, in the South Konkan, and in these all the males were typical, with prominent ocelli on the underside of the hindwing, and the median fascia obsolete; while all the females have the ocelli minute or obsolete, and the median fascia prominent. Typical specimens have also been taken in the Upper Godavari districts, by Mr C. R. Morris in September; and at Trevandrum and in the Ashambo Hills, in May, by Mr. Harold Fergusson. The specimens from the South are much darker in tone than those from North-East India. Two male specimens from Chumba notably differ from typical *Y. huebneri* in the uniform colour of the upperside with no dark marginal line, and in the uniformly and densely striated underside, with no trace of fasciæ. These are the only specimens we have seen from North-West India, and are a distinct geographical variety.

The figure shows the upper and undersides of a male specimen from Barrackpore in Major Marshall's collection.

218. *Ypthima ceylonica*, Hewitson.

Ypthima ceylonica, Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, p. 288, pl. xviii, figs. 14, 15 (1864); *Ypthima ceylonica*, Moore, Lep. Cey., p. 25, pl. xii, figs. 5, male, 5 a, female (1880).

HABITAT: Ceylon, Travancore, Madras, Orissa.

EXPANSE: 1'1 to 1'55 inches.

DESCRIPTION: "UPPERSIDE rufous-brown. Forewing with one large ocellus, with two silver pupils. Hindwing with the outer half white, the outer margin and a submarginal line of black; one obscure ocellus and a minute black spot. UNDERSIDE white, undulated with rufous-brown. Forewing with the ocellus as above, thickly undulated towards the outer margin. Hindwing slightly undulated near the margins, with four ocelli, one near the apex, three near the anal angle, the outer ocellus minute, blind, the anal ocellus with two pupils of silver."

"The ocelli on the underside of the hindwing differ much. In one specimen, three are perfect, one blind; in another two only are perfect." (Hewitson, l. c.)

This is a very remarkable species; on the UPPERSIDE the lower half of the hindwing is pure snowy white, contrasting strongly with the brown hue of the rest of the wing; the FEMALE is similarly coloured to the male, but both sexes show considerable variation. On the UPPERSIDE of the hindwing there is often a subapical black spot, with sometimes a smaller one below it, and three rather large subanal perfect ocelli, sometimes one or more blind; the upper one is often minute and the lower one sometimes wanting altogether. On the UNDERSIDE the forewing is undulated throughout, finely and sparingly towards the base, densely on the outer area; the hindwing is typically almost entirely pure white, there being only a few delicate undulations near the margins, but in some specimens the basal area is also undulated, and in others again the undulations extend, though sparingly, over the entire wing. The ocellation of the underside is as in *Y. huebneri*, and as in that species is variable.

Till quite recently *Y. ceylonica* was believed to be confined to the island of Ceylon; but it has now been taken in Travancore by Mr. H. Fergusson, and in Orissa by Mr. W. C. Taylor, and Mr. Kirby records it from Madras. In the Orissa specimens the striation of the underside is denser and shows a considerable approximation to *Y. huebneri*, to which it is evidently closely allied. The male has no trace whatever of the brand on the forewing.

In Ceylon *Y. ceylonica* is "very common at Galle and Colombo among grass and weeds by the roadside. Flight short, constantly settling down on leaves or in grass." (Hutchinson).

219. *Ypthima chenai*, Guérin.

Satyrus chenai, Guérin, in Deless. Souv. Voy. Ind., pt. ii, p. 77, pl. xxi, figs. 2, 2 a (1843), female; *Ypthima chenai*, Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, p. 295, a. 7 (1864). *Ypthima chenai*, Kirby, Syn. Cat. D. L., p. 95, a. 15 (1871).

HABITAT: Nilgiri Hills, South India.

EXPANSE: 1'33 to 1'75 inches.

DESCRIPTION: "UPPERSIDE greyish-brown, with some fine nebulous paler stripe towards

the outer margin. *Forewing* with, near the apex, a large round black ocellus with wide yellow iris, and two small pupils of shining blue. *Hindwing* with two much smaller ocelli, black, with yellow iris, and a single very small blue pupil, placed submarginally between the median nervules. *UNDERSIDE* ashy-grey with numerous small undulated transverse brown striae. *Forewing* with the ocellus as on upperside. *Hindwing* with three [four in the figure] ocelli, the two of the upperside, and a third near the costa and more distant from the outer margin, [and a fourth towards the anal angle, minute, geminate. This latter ocellus, though omitted from the original description, is clearly shown in Guérin's figure, and is of much importance as showing the affinity of the species with *Y. huebneri* rather than with *Y. motschulskii*] *Forewing* with the outer margin of a yellowish-brown, and two bands of the same colour starting nearly from the same point on the inner margin near the hinder angle and diverging towards the costa, the one within the other beyond the large subapical ocellus. *Hindwing* with the external margin equally yellowish-brown, and with three bands of the same colour, and the commencement of a fourth band, on which is placed the ocellus near the costa. The band near the base is slightly arched, and does not reach the inner margin; the two others diverge from the anal angle to the costa on either side of the apical ocellus. *Body* and *antennæ* brown, the underside variegated with grey. There are also smaller individual specimens which do not at all differ from this description." (*Guérin*, l. c.)

Y. chenii is a rare species. Guérin's figure is evidently that of a female, and the single female specimen in Mr. de Nicéville's collection, which is the only one that we have seen, corresponds exactly with it; the male is apparently unknown, but it is probable that the smaller specimens referred to above by Guérin were males, and that the sexes do not differ in colouration. Unfortunately the original descriptions of the species in this genus, in no case mention the sexual mark on the wing of the male insect, but it is most probable that in this species the male mark is wanting. It flies in July in the Nilgiri Hills.

220. *Ypthima robinsoni*, Distant.

Y. robinsoni, Distant, Ann and Mag of Nat Hist, fifth series, vol. x, p. 406 (1892).

HABITAT: Pulni, and Rhodi canal, South India.

EXPANSE: 1·27 inches.

DESCRIPTION: "UPPERSIDE very dark fuliginous. *Forewing* with an ovate ocellated spot (black, with two small bluish centres and an ochraceous margin) placed a little beyond the cell, its upper margin reaching just above the upper discoidal nervule, and its lower margin extending a little beneath the first [third] median nervule. *Hindwing* with two small rounded ocellated spots (black, with a bluish centre and ochraceous margin) placed between the median nervules. *UNDERSIDE*: *Forewing* slightly paler than on upperside, with the ocellated spot brighter, and crossed by two dark transverse fasciæ, the first near the apex of the cell, and the second somewhat submarginal. *Hindwing* greyish, with numerous dark strigæ, which are very thickly and confluent situate at the basal area, and crossed by three dark fuscous fasciæ, the first and narrowest very slightly curved, passing through the middle of the cell, the middle one very oblique, crossing the apex of the cell, and the third submarginal, broadest near the apex, and narrowing towards the anal angle; between the second and third fasciæ the colour is very pale greyish, and contains a small ocellated spot between the subcostal nervules; on the dark outer fascia are three ocellated spots, placed two between the median nervules and one between the first median nervule and submedian nervule; all these spots are black, with bluish centres and ochraceous margins. *Body* and *legs* more or less concolourous with the wings."

"This species is allied to *Y. chenii*, Guérin, from which it differs, on the underside, by the darker colouration, the different direction of the two dark fasciæ on the forewing, which do not approximate towards each other on the inner margin as in Guérin's species, and also by the second and third dark fasciæ on the hindwing, which in *Y. robinsoni* are subparallel and placed somewhat close together, the ocellated spots much smaller, &c." (*Distant*, l. c.)—

* We have never seen *Y. robinsoni*, but from the description it appears to approximate very closely to *Y. ypthimoides*, if indeed the two descriptions do not apply to one and the same species.

No indication of difference between the sexes is given, nor is any mention made of the presence or absence of the sexual patch on the forewing of the male; in all probability this mark is absent as in *Y. huebneri*.

221. *Ypthima ypthimoides*, Moore.

Callerebia ypthimoides, Moore, Trans. Ent. Soc. Lond., 1881, p. 307.

HABITAT: Hills of Travancore, South-India.

EXPANSE: ♂, 15 to 19; ♀, 19 to 20 inches.

DESCRIPTION. "MALE and FEMALE: UPPERSIDE dark olive-brown. Forewing with a bipupilled ocellus encircled by a narrow indistinct orange-yellow border. Hindwing with two small subanal ocelli. UNDERSIDE numerously covered with grey stigmæ. Forewing with the ocellus as above, and a slight brownish submarginal and a discal fascia. Hindwing with three broader and more distinct transverse fasciæ, a small apical ocellus and four lower, smaller, decreasing ocelli." (Moore, l. c.)

Originally described as a *Callerebia*, but the arrangement of the subcostal nervules of the forewing is as in *Ypthima* to which it certainly belongs, the colour approaches that of a *Callerebia*, but the markings are those of an *Ypthima*. The genus *Callerebia* is restricted in India to the Himalayas and outlying ranges.

Mr. Fergusson writes from Travandium: "*Ypthima ypthimoides* is to be found on the hills here only on grass land near the tops of the hills. The specimens I got were from two localities—one a small patch of grass about an acre in extent, at an elevation of 3,500 feet, and the other on a grass hill called Pon Mudi (golden hill) about 3,000 feet; here they were fairly abundant." It also occurs in April at Colathoopalay Patna, 4,000 feet, Travancore.

In the nine males which Mr. Fergusson has sent us there is no variation on the upperside, but on the underside of the hindwing in one specimen there are two additional ocelli, placed one on either side of the discoidal nervule, and in one female on the upperside of the hindwing there are two additional small geminate ocelli at the anal angle; and in another female there are three further additional small ocelli placed above the two large median ocelli, making seven in all. On either side of the outer dark fascia on the underside of the hindwing there are two pale, almost white fasciæ, in fresh specimens.

222. *Ypthima singala*, Felder.

Ypthima singala, Felder, Verh. zool. bot. Gesellsch., vol. xviii, p. 283 (1863). *Ypthima singala*, Moore, Lep. Cey., p. 24, pl. xii, figs. 3, 3a (1880), male.

HABITAT: Ceylon, India.

EXPANSE. 13 to 15 inches.

DESCRIPTION. "MALE UPPERSIDE brown. Hindwing [typically immaculate] with one, sometimes two, small, indistinct, subanal spots encircled with yellow. UNDERSIDE cinereous, numerously covered with short brown strigæ. Forewing with transverse indistinct brown discal and marginal band, and a prominent bipupilled ocellus. Hindwing with six [five in the figure, the uppermost being absent] small well formed ocelli disposed in regular linear order, the first upper being very minute. FEMALE UPPERSIDE: Forewing with a subapical bipupilled ocellus. Hindwing with three small subanal ocelli. UNDERSIDE as in the male." (Moore, l. c.)

Felder's original description* is given in comparison with *Y. lysandra*, Hewitson, nec

* *Y. singala*, Felder. DESCRIPTION. "MALE a little larger than *Y. lysandra*, Hewitson, nec Cramer. Forewing with the apex, hindwing with the anal angle more produced, the disco-cellular nervules of the forewing more oblique, and therefore, the upper angle of the cell more drawn back. UPPERSIDE, both wings (in our specimen) immaculate. UNDERSIDE pale hoary, much more densely and uniformly strated with fuscous. Forewing with an ocellus with narrower iris than in that species. Hindwing with five small ocelli, three lower in the same line, the second (below the second subcostal branch) and the fourth (between the first and the second median branches) a little larger." (Felder, l. c.).

Cramer; it is clear that the species identified by Hewitson with *Y. lysandra*, Cramer, was not that species, but what it really was we cannot ascertain. The true *Y. lysandra* is from China, and is very distinct, the **UPPERSIDE** being uniform rather dark brown, with one bipupilled ocellus in the *forewing*, and three subanal prominent on the *hindwing*. The **UNDERSIDE** is ochreous, uniformly striated with brown. *Forewing* with the ocellus as usual, no dark fasciæ, the inner margin broadly white. *Hindwing* with two prominent subapical ocelli on a short dark band, beyond and in continuation of which is a whitish fascia to the inner margin; below this is another short dark band from anal angle bearing three prominent ocelli placed in a line.

Y. singala was originally described from a specimen from Badulla in Ceylon at an elevation of 3,000 feet. In Moore's "Lep. Ceylon" it is stated to be "rare; a few specimens only taken in long grass on borders of coffee-plantations at Buselowe, 3,000 feet elevation." (Hutchinson). In the Indian Museum, Calcutta, there are five specimens of the male, three of them typical with no ocelli on the upperside on either wing, and two have two subanal ocelli on the hindwing, the upper minute and evanescent. On the underside of the *hindwing* four ocelli are always present, one above the discoidal nervule, and one below each median nervule; sometimes there are six by the appearance of a minute apical and a minute subanal ocellus, and sometimes five by the absence of one or other of these latter: the linear arrangement of these ocelli distinguish *Y. singala* from all other species of this group except *Y. thora*, which is closely allied to it, and *Y. bolanica* which is otherwise widely diverse. The **MALE** of *Y. singala* has no trace of a sexual patch on the *forewing*.

Until recently *Y. singala* was believed to be confined to the island of Ceylon, but in October last a pair, male and female, were taken by Mr. J. A. Betham in the Central Provinces near Nagpore, which are inseparable from Ceylon examples. A specimen in Major Marshall's collection, taken at Barrackpore in November, seems to link this species with *Y. huchneri*, the third and fourth ocelli of the hindwing are slightly out of line, the anal pair is geminated, and the first is larger than the second. In Colonel Lang's collection are two typical males from Kussowli; and a very aberrant male from the Rajmaha district, with the fasciæ on the underside of the hindwing very prominent.

223. *Ypthima thora*, Moore.

Y. thora, Moore, Lep. Cey., p. 24, pl. xii, figs. 1, 40 (1880), male.

HABITAT: Ceylon.

EXPANSE: ♂, 1.4 inches.

DESCRIPTION: "MALE: **UPPERSIDE** brown. *Forewing* with a prominent subapical bipupilled ocellus. *Hindwing* with a small indistinct subanal ocellus. **UNDERSIDE** cinereous, numerous covered with short delicate brown stigmæ. *Forewing* with a very indistinct discal and marginal band, ocellus prominent. *Hindwing* with five very minute ocelli, disposed in linear order." (Moore, l. c.) **FEMALE** somewhat paler than the male, wings broader, the markings identical.

We have never seen this species; it is evidently very closely allied to *Y. singala*, but appears to be distinct, though the only point of difference is on the upperside of the *forewing*, which has an ocellus which is absent from male *Y. singala*, though present in the female of that species. It is not known whether the **MALE** has or has not a sexual patch on the *forewing*; in all probability it is absent, as in *Y. singala*.

224. *Ypthima bolanica*, Marshall, n. sp.

HABITAT: Mach, Bolan Pass, Beluchistan.

EXPANSE: ♂, 1.6 inches.

DESCRIPTION: MALE: **UPPERSIDE** dark brown, (distinctly glossed with purple in some lights when fresh as in *Callerebia*). *Forewing* with a prominent black ocellus with two large bluish-silver pupils and narrow yellow iris, ringed with dark brown, then with mottled purplish

more broadly, and then again with dark brown. *Hindwing* with one black ocellus very prominently pupilled with bluish-silver between the lower median nervules some distance from the margin, and two bluish-silver specks on the submarginal dark line near the anal angle being the pupils of obsolete geminate ocelli, a submarginal sinuous dark brown line: the margin of both wings narrowly whitish, defined on the inside with dark brown; the *cilia* brown. *UNDERSIDE* greyish-white, covered more or less with fine reddish-brown strigæ. *Forewing* with the ocellus as on upperside. *Hindwing* with six ocelli, the first three in a line from the costa small, the third minute, the fourth between the first and second median branches large, the fifth and sixth geminated at the anal angle, all prominently pupilled with bluish-silver as on the upperside; the *cilia* brown, the margin of both wings narrowly pure white inwardly defined by a brown line, then a whitish mottled line, broadest at costa of forewing and ending at the fifth ocellus of the *hindwing*; two brown lines one on each side of the ocellus of forewing, and meeting below it, continued on the *hindwing* as a single narrow band on which the first three ocelli are placed, and terminating just beyond the third; a short brown line from the costa of forewing, defined exteriorly with whitish, and again another brown line continued across the hindwing to the abdominal margin, and on the latter wing defined externally with whitish, the basal area more densely striated than the external area; no defined fascia on basal half.

Y. bolanica is unlike any other known species of this genus; it perhaps most nearly approaches *Y. ordinata* in the markings of the underside, but there is no trace of a subbasal fascia; the median and submarginal fasciæ are much more distinct, the ground-colour beyond the median fascia is whiter, and the ocellation is very deficient, the six ocelli of the hindwing being nearly in a straight line. The median nervure is much swollen at the base, more so than in any other species; and there is no trace of the sexual patch on the forewing of the MALE.

Taken by Lieutenant-Colonel Swinhoe, in whose collection the type specimen is, at Mach in the Bolan Pass in September, 1879.

225. *Ypthima sakra*, Moore. (PLATE XVII, FIG. 67 ♂.)

Ypthima sakra, Moore, Horsfield and Moore, Cat. Lep. E. I. C., vol. i, p. 236, n. 508 (1837) · id., Hewitson, Trans. Ent. Soc. Lond., third series, vol. ii, p. 290, n. 18, pl. xviii, fig. 18 (1864).

HABITAT: Himalayas, Khasi and Naga Hills, Upper Burma.

EXPANSE: 1·85 to 2·1 inches.

DESCRIPTION: "UPPERSIDE [brown], with five ocelli, one being on the forewing, three near anal angle, and one (but indistinct) near anterior angle of the hindwing. UNDERSIDE yellow, covered with short narrow dark brown strigæ. Hindwing with geminated anterior, and three single posterior ocelli." (Moore, l. c.)

For remarks see the next species, *Y. nikaa*.

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

226. *Ypthima nikaa*, Moore.

Ypthima nikaa, Moore, Proc. Zool. Soc. Lond., 1874, p. 567.

HABITAT: N.-W. Himalayas.

EXPANSE: 1·7 to 2·1 inches.

DESCRIPTION: "UPPERSIDE dark brown; pupils of ocelli blue. Forewing with a subapical bipupilled ocellus (smaller than in *Y. sakra*). Hindwing with two subanal ocelli. MALE sometimes with only one subanal ocellus. UNDERSIDE grey, with numerous short brown narrow strigæ. Forewing with the ocellus as above, and a distinct brown submarginal transverse fascia. Hindwing with five ocelli, the two apical being the largest and joined together, though having a yellow band between them; the other three ocelli in a linear series from anal angle, the anal one bipupilled."

"Differs from *Y. sakra* in its smaller size, darker colour above and greyer below; and may be distinguished by the difference of the apical ocelli on the hindwing, which in *Y. sakra* have no intervening yellow band." (Moore, l. c.)

This species seems to us to be but a casual variety of *Y. sakra*. Taking the absence of the yellow intervening band between the apical ocelli of the underside of the *hindwing*, as given by Mr. Moore, as the test character, we have specimens of *Y. sakra* from the Eastern hills of Manipur, Shillong in the Khasi hills, Sikkim, Simla, Pangl, and various localities in the Chumba State which borders on Kashmir: while we have *Y. nikaa* from many localities in the North-West Himalayas, and a typical specimen from the eastern hills of Manipur.

Of the specimens of *Y. sakra*, that from Manipur has only three ocelli on the UPPERSIDE of the hindwing, the apical one being absent; those from Shillong have four ocelli, the one nearest the anal angle being however minute or obsolescent, and one specimen (the one figured) has only two ocelli; the specimens from Sikkim are typical, having all four ocelli prominent; one from Chumba is also typical, with all four ocelli prominent; one from Simla has three ocelli, the one nearest the anal angle being absent; others from Pangl and Chumba have only two ocelli placed between the median nervules (as in the Shillong specimen figured), the upper one sometimes minute. On the UNDERSIDE there is more uniformity, all the specimens having the five ocelli of the *hindwing*—two apical, three subanal—prominent, except in one specimen from Simla, in which the ocellus of the upper median interspace is minute, and another has this ocellus absent altogether, and one from Kujar in the Chumba State has the anal ocellus quite round with a single pupil. There is considerable variation in the density and coarseness of the striation, in the tone of the ground-colour, and the prominence of the submarginal dark band: the Eastern specimens are as a rule yellower, the striation is coarser, and the submarginal band more prominent; but there are exceptions to every point. The FEMALE has broader wings, and the upperside is less uniform in colour, having frequently a broad nebulous submarginal band of pale stræ, these stræ sometimes extending with more or less density over the entire wing.

The specimens of *Y. nikaa* vary quite as much, but the occurrence of four ocelli on the UPPERSIDE of the hindwing is very rare; usually there are two, and frequently there is only one; the anal ocellus is generally altogether wanting, the ocellus between the lower median nervules is always present; the one between the upper median nervules is also found in both sexes wherever the ocelli are limited to two in number, and occasionally there is a third ocellus above the discoidal nervule. On the UNDERSIDE typically the ocelli are five in number as in *Y. sakra*, but frequently the ocellus of the upper median interspace is absent, leaving two near apex and two near anal angle, presenting very much the appearance of *Y. hyagrira*; the density and coarseness of the striation, the tone of the ground-colour, and the prominence of the submarginal dark band, are all as variable as in *Y. sakra*. The FEMALE differs from the male as in *Y. sakra*.

In both species and in both sexes there is occasionally a second ocellus on the underside of the *forewing* placed in the lower median interspace. The uniform brown of the upperside, and the uniform striation of the underside, together with the large size, serve to distinguish both *Y. sakra* and *Y. nikaa* from other species of the genus.

Y. sakra was taken in the Manipur hills in May by Mr. A. O. Hume; in Shillong it occurs in May and also in September; in Sikkim it has been taken at an elevation of 7,000 feet in September; in the N.-W. Himalayas it has been taken in Chumba at 6,000 feet elevation in April and May by Major C. H. T. Marshall; and throughout the hills at 6,000 to 8,000 feet elevation it is common in the rains on grassy slopes and at the edges of forests.

Y. nikaa was also taken in May in the Manipur hills; and in the N.-W. Himalayas, it occurs in April and May, and throughout the rains it is extremely common at 6,000 to 8,000 feet elevation in suitable localities; out of a large series taken by Mr. de Nicéville at Simla there is not a single specimen of *Y. sakra*, and though by no means universal, *Y. nikaa* is evidently the dominant form in the west, as *Y. sakra* is in the east.

227. *Ypthima tabella*, Marshall, n. sp.

HABITAT: Wynnad, South India.

EXPANSE: ♂, 1.15 inches.

DESCRIPTION: MALE. UPPERSIDE brown, uniform in shade. Forewing with a not very prominent bipupilled ocellus. Hindwing with two submarginal ocelli between the median nervules, the upper one minute. UNDERSIDE paler brown, with greyish undulations most numerous on the hindwing. Forewing with the ocellus as usual. Hindwing with six ocelli placed in pairs in echelon, the apical pair geminate on the lower subcostal nervule, the upper minute, the median pair complete but touching on the median interspaces, the anal pair geminate, the lower being extremely minute, the outer margin somewhat darker, but no trace otherwise of fasciæ on the underside. No sexual patch on forewing on upperside.

At first sight *Y. tabella* appears to be only a dwarf specimen of *Y. sakra*, but the grayer tone of the striation of the underside, the subanal ocellus being geminated not bipupilled, the very small size, and also the locality from whence it comes, mark it as distinct. It is distinguished from *Y. philomela* and its allies by the absence of the sexual mark in the male. Nothing approaching *Y. sakra* is known to occur south of the Khasi hills in the vast intermediate country between them, and the Wynnad where *Y. tabella* appears.

Genus 21.—RAGADIA, Westwood. (PLATE XV.)

Neonympha, subgenus *Ragadia*, Westwood, Gen. D. L. vol. ii, p. 376 (1851).

"Distinguished from *Neonympha* [an American genus] by the very singular arrangement of the veins of the wings, especially of the hindwing; the lower disco-cellular nervule being placed almost at the base of the wing, and furnished with an elongated pouch in the males. The costal nervule of the forewing is alone swollen at the base." (*Westwood*, l. c.)

BODY slender. HEAD wide, antennæ slender, distinctly articulated, with a slender gradually formed club. EYES almost naked. PALPI moderately long, densely clothed in front with rather long bristly hairs, not tufted at the back, terminal joint slender. FOREWING somewhat elongate; costa slightly curved; outer margin oblique, slightly convex; costal nervule alone swollen at the base, the remaining nervules simple; disco-cellular nervules concave, the upper very short, the middle long, the lower longer still, and joining the median nervule at an acute angle some distance beyond the origin of its second branch; subcostal nervule with its branches free and short, the second originating beyond the cell, as in *Ypthima*, discoidal nervules from the junctions of the disco-cellulars, the upper one originating very close to the subcostal nervule. HINDWING rounded; precostal nervule very short, curved outwardly; costal nervule curved at base, and joining the costal margin at about one-half its length. Subcostal nervule almost straight; discoidal cell very short and acute; discoidal nervule curved at its base and appearing to originate from the subcostal nervule below; the lower disco-cellular appearing to originate from the subcostal at some distance nearer the base, then acutely angled outwardly and joining the median nervule at a very acute angle some distance before the origin of its first branch; along its free part closing the cell it is simple in the FEMALE, but in the MALE it is developed along its underside into a narrow glandular pouch, and on the upperside is furnished with a small tuft of fine long hairs which lie along it. FORELEGS of the FEMALE slender, destitute of hairs, the joints of the tarsus very short, dilated, distinct, each furnished with a single spine on the lower side, and appearing as a clubbed termination to the slender leg: of the MALE wanting in our only specimen.

Ragadia is a very remarkable and aberrant genus; and its affinities are difficult to determine; according to the characters taken in the key to the genera it should have come in the first group, as the apex of the cell in the hindwing is distinctly not beyond the origin of the second median nervule, nor are the eyes entirely destitute of hairs; of the first group it has most affinity with *Mycalopsis*, especially in the dilation of the disco-cellular nervule in the hindwing and the tuft of hairs along it in the male, but its nearest ally is evidently *Ypthima*, with which it corresponds in the arrangement of the subcostal nervules of the forewing; in the brilliant

silver pupillation of the ocelli; in the shape of the wings and in habits. It differs in style of colouration and structurally in having the median nervure of the forewing simple, though, even in this feature some species of *Ypthima* approach it; but the curious construction of the cell of the hindwing places it apart by itself. Only a single species of this genus is found within our limits, occurring in Burma and North-Eastern Bengal; and only one other species is known which inhabits Java, Borneo, and the Philippine Islands, with varieties in Mindanao and Luzon. The Indian species is a small brown insect with whitish transverse bands crossing both wings, and with a complete discal series of silver-pupilled ocelli on both wings on the underside.

228. *Ragadia crisilda*, Hewitson (PLATE XV, FIG. 367.)

R. crisilda, Hewitson, "Ex. Butt., vol. iii, *Euptychia* et *Ragadia*, figs. 5, 6 (1862), female.

HABITAT: Sylhet, Tenasserim.

EXPANSE: ♂, 1·6; ♀, 1·85 inches.

DESCRIPTION: MALE and FEMALE: "UPPERSIDE brown, both wings crossed at the middle by a broad oblique band of white; both with a narrow band of white parallel to the outer margin, obscured towards the apex of the forewing, [and both showing the pale basal bands of the underside through by transparency]. UNDERSIDE white; both wings with the outer margin and five transverse bands brown, three parallel bands before the middle (crossing the forewing obliquely), the fifth band near the outer margin narrow; the fourth beyond the middle [broad], marked with numerous ocelli, on the forewing by six of equal size, [in our specimens of both sexes there are eight ocelli, the upper one minute, the two lowest small placed in the interspace below the first median nervule]; on the hindwing by seven [six in our male specimen], the third and fifth the largest; the seventh (near the anal angle) minute; all black, with silver pupils, the iris orange; the second, third, and fourth ocelli of the hindwing enclosed in one iris" (Hewitson, l. c.) The FEMALE is slightly larger than the male, and has the wings broader and more rounded, the white markings all sullied; all the ocelli larger.

R. crisilda is apparently a rare insect. It was originally described from Sylhet, and Colonel Lang's collection contains two males from that locality; Kirby notes it from the Khasi hills, (if this is correct it probably only occurs at the foot of them), and the Indian Museum, Calcutta, has two specimens, believed to have been taken in Cachar. The only recent record of its capture is by Captain C. H. E. Adamson, who took several specimens flying among long grass by the Aploon Choung in the neighbourhood of Moulmein in October, the only occasion on which he ever saw them.

The figure is taken from a female specimen in the Indian Museum, Calcutta, from Cachar, and shows both upper and undersides.

Genus 22.—ERITES, Westwood. (PLATE XVI)

Satyrus [*Hipparchia*]. subgenus *Erites*, Westwood, Gen. D. L., vol. ii, p. 392 (1851). *Erites*, Distant, Rhop. Malay., p. 40 (1882).

"FOREWING somewhat elongate and narrow, with the costa arched and slightly convex at its apex, the apex rounded [sometimes slightly falcate]; outer margin nearly straight, or very slightly waved inwardly about the middle; inner margin nearly straight [about equal in length to the outer margin]; costal nervure very strongly dilated at the base; first and second subcostal nervules emitted before the end of the cell; upper disco-cellular nervule very short, directed a little outwardly at base, and then somewhat concavely in its greater length to apex; lower disco-cellular nervule nearly straight, and very slightly directed either outwardly or inwardly. HINDWING irregularly subovate, with the outer margin waved and produced into an obtuse angle or tail near the first [third] median nervule; nervules well separated at their origin; disco-cellular nervules about or almost subequal in length, the upper one concave, the lower one almost straight. [HEAD wide]; eyes prominent and naked; palpi clothed beneath with fine long semi-erect hairs, somewhat separated and placed in tufts; antennæ slender, the apical portion slightly and gradually thickened." [BODY slender]. (Distant, l. c.)

This is a very beautiful genus; the wings are delicate and semi transparent; the forewing has a large ocellus at the hinder angle, and four small ones above it, and the hindwing has a complete submarginal row of ocelli, and both wings are crossed by two median fasciæ, the outer one much angled on the hindwing; the markings of the underside show through by transparency on the upperside. The wings of the FEMALE are slightly broader than in the male, the forelegs are long, slender, destitute of hairs, of the MALE shorter, and very hairy. The male has no sexual glands or tufts of hair.

Erites is an Indo-Malayan genus, only five species are known; the type *E. medusa* is found in Java and Sumatra, two species are found within our limits, one in Tenasserim and the other in Cachar, the remaining two are found in Borneo and Labuan. The Indian species both appear to be local and not common even where they occur.

Key to the Indian species of *Erites*.

A. Wings pale brown, forewing with a large black ocellus at the hinder angle

The forewing not falcate the large ocellus blind on upperside and with a large bluish silver pupil and wide well defined ochreous iris on underside

229 *E. ANGULARIS*, TENASSERIM

The forewing soon ewh it falcate the large ocellus with prominent pure white pupil and narrow indistinct iris on both upper and undersides.

230 *E. FALCIPENNIS*, CACHAR

229 *Erites angularis*, Moore (PLATE XVI, FIG 50 ♀)

E. angularis, Moore, Proc Zool Soc Lond, 1878, p 82, id., Listant, Rhop Malay, p 46 pl v, fig 3 (1882), male

HABITAT Upper Tenasserim, Peiak.

EXPANSE. 2 12 to 2 50 inches.

DESCRIPTION: "MALE: Wings longer than in *E. medusa*, Horsfield* (from Java); the forewing, being more produced at the apex and the hindwing posteriorly. UNDERSIDE similarly marked, excepting that the yellow-bordered black spot on the forewing is more oval, and the spots on the hindwing smaller, this wing also having the inner yellow band acutely angled in the middle" (Moore, l c.)

MALE - UPPERSIDE light brown. Forewing fuscous towards the outer margin; all the markings of the underside showing through by transparency. Hindwing with five black submarginal spots, with or without small yellowish pupils, the fifth on the lower median interspace the largest, with distinct yellow iris and fuscous outer ring, the rest with the yellow iris and fuscous ring decreasingly fainter; three dark brown lines on the margin following its contour and divided by yellow lines, prominent on the hindwing, obsolescent on the forewing. UNDERSIDE pale brown, pearly on the hindwing. Forewing undulated throughout with fuscous striae, with two fuscous bands across the disc, the inner straight, the outer concave, beyond which is a large oval black ocellus near the hinder angle, with large silvery-bluish eccentric pupil, broad yellow iris, and narrow outer fuscous ring, above which are four small faint submarginal ocelli, three dark lines on the outer margin divided by yellow lines. Hindwing also undulated with fuscous striae, with two yellow bands in continuation of the bands on the forewing, both sharply angulated outwards at the middle, the inner on both edges, and the

* *Erites medusa*, Horsfield HABITAT JAVA EXPANSE 2 45 inches DESCRIPTION UPPERSIDE pale brown, much darker on the margins, the stripe of the underside showing through on the basal area. Forewing with a brown streak crossing the wing obliquely, and continued on to the hindwing, cutting the lower outer angle of the cell in the forewing, and crossing the middle of the cell on the hindwing, beyond this a much darker brown sinuous streak across the disc, which is also continued on to the hindwing, where however it is ochreous and highly angled, and deflexed with dark brown on both edges. A large round black ocellus near the hinder angle, with a pale pupil, yellow iris and dark outer ring, two small ocelli above, one on each side of the lower discoidal nervule. Three marginal black lines divided by yellow lines. Hindwing with four large submarginal ocelli, with pale pupils and wide yellow irides, all touching. Three marginal fine yellow lines. UNKNOWN paler, the fasciæ on both wings ochreous the subtypical ocelli of the forewing more distinct and three in number, the large lower ocellus more oval in shape than on the upperside. Hindwing with the submarginal ocelli smaller and the irides less distinct. (Described from Horsfield's figure in the Cat Lep. E. I C. pl v, figs 8, 20 (1839).) Hewitson records (Jour. Linn Soc Lond, Zoology, vol viii, p 145 (1865), a variety of *E. medusa* from Singapore and Sumatra, and another from Singapore and Sarawak.