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LONDON:
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Male and female differ only in their smaller size, paler colouring, and narrower bands.

Antennæ, frons and thorax in front orange-pink, rest of thorax and abdomen above greenish-grey, below pale yellow like the wings and legs.

Expanse, ♂ ♀ $1\frac{9}{10}$ to $2\frac{1}{10}$ inches.

HABITAT.—Afghanistan, Beloochistan and Chitral; extends into Russia.

DISTRIBUTION.—We took both forms in Kandahar and Quetta, where it was not common, there are two dry-season forms in the B. M. from Chitral and two from Fergana, and some Wet-season forms from Sarepta in South Russia, and Hissar Mountains, Turkistan.

EURYMUS NILAGIRIENSIS.

Plate 603, figs. 1, ♂, 1a, ♀, 1c, ♀ (Wet-season Brood), 1b, ♂ (Dry-season Brood).

Colias Nilagiriensis, Felder, Wien, Ent. Mon. iii. p. 395 (1859). Wallace, Trans. Ent. Soc. 1867, p. 391. Hampson, Journ. As. Soc. Bengal, 1888, p. 362. Fergusson, Journ. Bo. Nat. Hist. Soc. 1891, p. 444.

Colias Nilgiriensis, Butler, Proc. Zool. Soc. 1881, p. 607. Bingham, Fauna of Brit. India, Butt. ii. p. 234, pl. 18, fig. 121 (1907).

Colias Hyale, var. *Nilgherriensis*, Elwes, Trans. Ent. Soc. 1884, p. 23.

Colias Hyale, var. *Nilgiriensis*, Verity, Rhop. Palearctica, p. 225, pl. 40, figs. 40, 41 (1909).

Wet-season Brood (Figs. 1, ♂, 1a, ♀, 1c, ♀).

IMAGO.—Male. Upperside lemon-yellow. *Forewing* with the basal third and costal space thickly irrorated with black scales, a large black oval spot at the end of the cell, exterior black border broad, occupying one-third of the wing, its inner margin sinuous, and here and there running a little inwards on the veins; five or six spots of the ground colour across its middle, four sub-apical and one below its middle, the spots fairly uniform in size, the lowest generally the largest, the band deepest at the apex, its inner margin more or less curved, and it narrows gradually hindward on to the lower margin. *Hindwing* with black irrorations spreading all over the wing, except for a large round space at the end of the cell, which is of the ground colour with an orange-yellow centre, the irrorations dark at the base and gradually paling outwards, the black exterior marginal band fairly broad at the apex, narrowing gradually upwards and hindwards, its inner margin suffused and traversed by spots of the ground colour; cilia of both wings white marked with pinkish-orange. Underside much paler yellow. *Forewing* with the costal line dark orange-red, with two darker spots near the apex, a large black cell spot and an almost straight discal line of black spots. *Hindwing*, irrorated with greenish scales, an orange-red spot on the costa a little beyond the

middle, a white round spot at the end of the cell, with a small one above it, both ringed with orange-red, a discal whorl of orange-red dots; cilia of both wings orange-red; the costal line of the hindwing of the same colour.

Female. Upperside white; fore and hindwings marked as in the male. Underside markings also similar, but the white ground colour of the wings gives them a brighter appearance.

Expanse, ♂ ♀ $1\frac{8}{10}$ inches.

Dry-season Brood (Fig. 1b, ♂).

Male and female only differ from the Wet-season form in being smaller and paler with the bands narrower, the yellow spots above large, and all the spots below more or less faintly indicated.

Expanse, ♂ ♀ $1\frac{5}{10}$ to $1\frac{6}{10}$ inches.

HABITAT.—Madras Hills.

DISTRIBUTION.—In our collection from the Nilgiri Hills, both forms; in the B. M. from the Pulni Hills; Wallace records it from Malabar, and Fergusson from Travancore.

EURYMUS SHIPKEE.

Plate 603, figs. 3, ♂, 3a, ♀.

Colias Shipkee, Moore, Proc. Zool. Soc. 1865, p. 492, pl. 31, fig. 13.

Colias Ladakensis, Felder, Reise Novara, Lep. ii. p. 197, pl. 27, figs. 8, 9, ♂ (1865). Wallace, Trans. Ent. Soc. 1867, p. 391. Moore, Proc. Zool. Soc. 1882, p. 254. Elwes, Trans. Ent. Soc. 1884, p. 24. Mackinnon and de Nicéville, Journ. Bo. Nat. Hist. Soc. 1898, p. 589. Bingham, Fauna of Brit. India, Butt. ii. p. 236 (1907). Verity, Rhop. Palearctica, p. 229, pl. 41, figs. 30, 32 (1909).

IMAGO.—Male. *Forewing* rich primrose-yellow, in some individuals having an orange tint on the disc of *forewing*; exterior margin broadly black, the inner margin of the band curved and sinuous and not sharply defined, the band broadest at the apex, a series of large yellow, more or less spear-shaped, spots within the band, a black spot closing the cell, in some examples this spot is annular, enclosing a yellow centre; cilia rosy. *Hindwing* primrose-yellow, more or less suffused in different individuals with dusky irrorations; a band of acute oval large yellow spots on the exterior margin, their edges more or less defined with black; cell closed by a very faintly defined orange spot; cilia rosy. Underside. *Forewing* paler yellow, the black margin of the upperside faintly visible, and of a greenish-grey colour, and having also indistinctly the series of yellow spots; the veins and the costal margin also greenish-grey, a black spot closing the cell as above. *Hindwing* dull dark greenish-grey; exterior margin showing the form of the spots of the upperside; a rufous spot with silvery centre at

the end of cell; antennæ and legs rosy; palpi greenish-yellow; head with frontal tuft; thorax and abdomen greenish-grey; forepart of thorax rosy.

Female. Very similar to the male. Upperside with the ground colour richer. *Forewing* with the black band on the exterior margin broader. *Hindwing* with the dusky irrorations more dense. Underside much as in the male.

Expanse, ♂ ♀ 2 inches.

HABITAT.—Thibet; Cashmir.

DISTRIBUTION.—In the B. M. from Ladak, Koka, Lahul, Cashmir, and many examples from Eastern Thibet. Flies with rapidity over the pastures on the mountain slopes above the Sutlej, near Shipkee, at an altitude of thirteen thousand to fifteen thousand feet, frequenting the meadow-land, rich in grasses and flowers, just below the melting snow-beds in June (Lang), also taken at Ladakh and Cashmir.

NOTE.—Moore's *Colias Shipkee* was published in October, 1865, Felder's description as well as his Plate 27 were not published till some time after that date; the dates on Felder's plates are the dates on which the proofs were completed, and seldom represent the date of publication. Dr. A. G. Butler has commented on this in Ann. Mag. Nat. Hist. 1870, p. 2.

EURYMUS ALPHERAKII.

Plate 604, figs. 5, ♂, 5a, ♀.

Colias Alpherakii, Staudinger, Berl. Ent. Zeit. 1882, p. 164. Elwes, Trans. Ent. Soc. 1884, p. 23.

Grum-Grshimailo, Rom. Mem. iv. p. 337, pl. 3, figs. 2a, 2b, 2c, ♂ ♀ (1890). Bingham, Fauna of Brit. India, Butt. ii. p. 239 (1907). Verity, Rhop. Palearctica, p. 226, pl. 41, figs. 15, 16 (1909).

Colias Alpherakii, var. *Roschana*, Grum-Grshimailo, Hor. Soc. Ent. Ross. 1893, p. 381. Verity, Rhop. Palearctica, p. 227, pl. 41, figs. 18, 19 (1909).

IMAGO.—Male. Upperside pale sulphur-yellow, nearly white. *Forewing* with the base, costal space and veins irrorated with black scales, a large, nearly oval black spot closing the cell, a broad black band, occupying the outer third of the wing, broadest at the apex, its inner margin recurved and irregular, a complete series of spear-shaped large spots of the ground colour through the middle of the band, one in each interspace, the first and third from the lower angle the smallest. *Hindwing* with some basal black irrorations, a large pale spot at the end of the cell, an apical black band, rather broad, almost filled with four large spear-shaped spots of the ground colour and not extending further hindwards. Underside whiter. *Forewing* with a large black spot at the end of the cell, costal line orange, the veins prominent, the outer band space limited by a discal row of black spots, the lowest large, decreasing in size upwards and becoming obsolescent. *Hindwing* with a marginal band of faintly indicated large spear-shaped spots, on a pale ground, the remainder of the wing densely irrorated with greenish-grey scales, a large round white spot at the end of the cell.

Female. Upperside whiter than the male. *Forewing* with no black irrorations, except a small patch at the base, the cell spot larger, and exterior black band broader, with the spots in it larger than in the male. *Hindwing* as in the male, but paler, an irregular blackish band with dark veins on the exterior margin. Underside as in the male. Antennæ, head and body pale sulphur-yellow, club of antennæ brownish-pink.

Expanse, ♂ ♀ 2 to $2\frac{2}{10}$ inches.

HABITAT.—Chitral.

EURYMUS ELWESI.

Colias Nastes, var. *Leechi*, Elwes, Journ. Bo. Nat. Hist. Soc. 1898, p. 466, ♂ ♀ (nom. preocc.).

Colias Leechi, Bingham, Fauna of Brit. India, Butt. ii. p. 238 (1907).

Colias Elwesi, Rober, Seitz, Gross Schmett. i. p. 63 (1907).

Colias Cocandica, var. *Elwesi*, Verity, Rhop. Palearctica, p. 233, pl. 42, fig. 24 (1909).

IMAGO.—Male. Upperside white slightly tinged with primrose. *Forewing* with a small patch of blackish irrorations on the lower half of the base, and some irrorations on the costal line, a black oval spot at the end of the cell, a blackish recurved discal band, curving inwards to the costa and outwards to the lower margin, joined on the veins to large spear-shaped spots on the exterior margin. *Hindwing* irrorated with blackish scales, except the cell and the outer marginal border, the latter pale space limited by a sinuous and somewhat zigzag blackish thin band, which becomes obsolescent hindwards, the irrorations darkest near the base and abdominal spaces. Underside white. *Forewing* with the cell spot small, exterior markings showing through the wing, limited by a row of blackish spots. *Hindwing* with the outer pale space limited by a whorl of brownish spots, the inner portion of the wing rather densely irrorated, the costal space and the entire cell free of irrorations and white.

Female. Very similar to the male both above and below, the discal bands slightly broader.

Antennæ and head pale pinkish-brown, palpi and body above and below dusky greenish-white.

Expanse, ♂ ♀ $1\frac{1}{2}$ inches.

HABITAT.—Native Sikkim.

DISTRIBUTION.—In the B. M. from Chonging Valley and Kardong Pass.

EURYMUS PHILA.

Colias Phicomone Phila, Fruhstorfer, Iris, 1903, p. 47.

One male from Kashmir, differs from about twenty males from the Alps, on account of the greater range and the brownish-red, instead of black, spot at the end of the cell of the forewing. The golden discal spot (or stain) of the hindwing is larger, the golden sub-marginal bands unusually broad, on the other hand all the black bands are much reduced.

Underside of the hindwing much darker green than in any European examples, although the tip of the apex of the forewing is brighter. Length of forewing 35 mm. = $1\frac{3}{8}$ inches. Kashmir, 17,000 to 19,000 feet. August, 1902.

Phicomone has up to now only been seen in the Alps, Pyrenees and Hungary, on this account the locality Kashmir is very interesting.

We have not seen this form; the above is Fruhstorfer's description; the block is from a figure he has kindly sent me.

Elwes, in *Iris*, 1903, throws doubts on a form of *Phicomone* being found so far east as Kashmir, and suggests it may be a form of *Cocandica*, but the figure certainly much more nearly represents *Phicomone*, and it has no resemblance to Elwes' *C. Leechi* which has been renamed *Elwesi* by Rober, the name *Leechi* being preoccupied in this genus.



Phila.

EURYMUS EOGENE.

Plate 605, figs. 2, ♂, 2a, ♀, 2b, ♀, 2c, ♀ (dimorphic form).

Colias Eogene, Felder, *Reise Nov. Lep.* ii. p. 196, pl. 17, fig. 7, ♂ (1865). Wallace, *Trans. Ent. Soc.* 1867, p. 390. Erschoff, *Lep. Turkistan*, ii. (v.) p. 6 (1874). Elwes, *Trans. Ent. Soc.* 1880, p. 136; id. 1884, p. 13. Alphéraky, *Stett. Ent. Zeit.* 1883, p. 493. Grun-Grshimailo, *Rom. Mem. Lep.* iv. p. 329, pl. 5, figs. 1a, 1b, 1c, ♂ ♀ (1890). Elwes, *Journ. Bo. Nat. Hist. Soc.* 1898, p. 465. de Nicéville, *Report Pamir Boundary Com. Nat. Hist. Results*, p. 16 (1898); id. *Journ. Bo. Nat. Hist. Soc.* 1902, p. 249, pl. FF, fig. 12, ♀. Leslie and Evans, *Journ. Bo. Nat. Hist. Soc.* 1903, p. 675. Bingham, *Fauna of Brit. India*, *Butt.* ii. p. 241 (1907). Verity, *Rhop. Palearctica*, p. 243, pl. 43, figs. 1 to 3, and pl. 44, fig. 1 (1909).

Colias Myrmidone, var. *Eogene*, Keferstejn, *Verh. Zool. bot. Ges. Wien*, 1883, p. 452.

IMAGO.—Male. Rich orange-vermilion, veins prominent. *Forewing* with a patch of blue-grey scales on the lower base, some ochreous irrorations on the costa, a black, nearly linear spot closing the cell, a broad glazed black outer marginal band, nearly uniform in width from costa to lower margin, occupying more than a fourth of the wing, its inner edge irregular but almost evenly curved; cilia crimson. *Hindwing* with more than the abdominal third covered with blue-grey scales, the outer border broad in its middle, narrowing upwards and hindwards and usually not reaching the anal angle; cilia crimson and white. Underside. *Forewing* with its inner portion pale crimson, the costal and outer spaces greyish-green, the latter limited by a row of blackish spots, a brown, white-centred spot at the end of the cell. *Hindwing* greyish-green, a pinkish patch at the end of the cell, containing a small round white spot, a discal row of more or less obscure brown spots. Cilia of both wings crimson.

Female. Dimorphic, in some examples coloured like the male, in others it is blue-grey. Upperside. *Forewing* with the veins always well marked, the cell spot large and pale-centred, the marginal band much broader than in the male, containing a row of pale spots, varying in number, the basal third of the wing irrorated with blue-grey

scales. Hindwing dusky black with blue-grey irrorations on the abdominal third, a large crimson patch at the end of the cell with an exterior tooth, three or four pale discal spots, often absent. Cilia of both wings crimson. Underside as in the male, but in the orange-vermilion form the interior portion of the forewing is suffused with bright crimson.

Palpi above, antennæ and collar crimson, body above greyish-black; below it is coloured like the wings; legs crimson.

Expanse, ♂ ♀ $1\frac{1}{2}$ to 2 inches.

HABITAT.—N.W. Himalayas.

DISTRIBUTION.—Sikkim, Kashmir, Ladak, Chitral, Thibet in B. M., and de Nicéville reports it from the Great Pamir and from the Little Pamir.

EURYMUS STOLICZKANA.

Plate 605, figs. 3, ♂, 3a, ♀, 3b, ♀ (dimorphic form).

Colias Stoliczkana, Moore, Ann. Mag. Nat. Hist. 1878, p. 229; id. Sci. Res. Yarkand Mission, p. 4, pl. 1, fig. 1 (1879). Elwes, Journ. Bo. Nat. Hist. Soc. 1898, p. 465. Bingham, Fauna of Brit. India, Butt. ii. p. 242 (1907).

Colias Eogene, var. *Stoliczkana*, Alphéraky, Rom. Mem. Lep. v. p. 74, pl. 4, figs. 4a, 4b, 4c, ♂ ♀. Verity, Rhop. Palearctica, p. 247, pl. 43, figs. 22 to 24, and pl. 44, fig. 2 (1909).

IMAGO.—Male. Upperside of a uniform orange-ochreous colour. *Forewing* with a small patch of blackish scales at the base, some ochreous-white scales on the costa near the base, a brown, almost linear spot with a pale centre at the end of the cell, and a broad dull black marginal band as in *Leechi*. *Hindwing* with the abdominal third irrorated with blackish scales, and a marginal band as in *Leechi*. Cilia of both wings pinkish-white. Underside also similar.

Female. Upperside generally white, in some specimens the interior of both wings is more or less tinged with bright ochreous-orange. *Forewing* with the veins blackish, the cell spot black, the outer marginal band about the depth of that in the male, a complete row of spear-shaped, large whitish spots across its middle, one in each interspace, decreasing in size upwards, the row bending in on to the costa, the lower spots connected by whitish lines to the exterior margin. *Hindwing*. Upperside more or less densely irrorated with black scales, a large round orange spot at the end of the cell, a row of large spots on the outer border, each connected with the margin as in the forewing, the upper part of the band very black. Cilia of both wings whitish. Underside as in the male.

Expanse, ♂ ♀ 2 inches.

HABITAT.—N.W. Himalayas.

DISTRIBUTION.—The type came from Ladak, recorded from Cashmir and Sikkim above 15,000 feet; in the B. M. from Chong Ching Valley and Kardong Pass.

EURYMUS MIRANDA.

Plate 604, figs. 4, ♂, 4a, ♀.

Colias Eogene Miranda, Fruhstorfer, Insectenbörse, Vom. 7 Mai, 1903; id. Iris, 1903, p. 48, pl. 1, figs. 3, 4, ♂ ♀. Verity, Rhop. Palearctica, p. 247, pl. 43, figs. 26, 27 (1909).

Colias Stoliczkana, Bingham (part), Fauna of Brit. India, Butt. ii. p. 242 (1907).

A splendid local form of *Colias Eogene*, Felder; the most important characteristic is that in *Miranda* the black outer border diminishes in the middle, whilst in *Eogene* it continues equally broad right up to the anal edge. The underside of the wings is a darker green and the black spot on the apex of the cell of the forewing as well as the brownish-red spot of the hindwing are much larger and more acute; on account of this larger spot *Miranda* resembles *Stoliczkana*, from which it differs, however, through the dark gold (instead of faded chrome-gold) ground colour, and through the brilliant unusually broad rose-colour extending to the cilia. *Stoliczkana* is moreover described from Ladak in North Kashmir, a place many hundred miles from Sikkim.

The female of *Miranda* is quite different from the male, and, on account of its clear beautiful colour contrast, is quite the most handsome of any of the known species up to present. The forewings are orange-coloured up to the black sub-marginal border; the outer border is (especially apically) very broad black, with a row of golden spots; on the costal edge, two pretty gold spots stand sub-apically; the hindwings (with the exception of the anal edge) are quite black, with a clear, long, orange-coloured discal spot; on the black outer edge are some beautiful golden spots, which anally become broader and in some examples meet together; the underside of the forewing is orange-coloured towards the base, and becomes by degrees golden towards the apex; the costal edge is dark green, the sub-costal and radial veins are light blue-green; the hindwings are, above the marginal edge, rich dark green; the sub-marginal zone, however, has between the veins some dark citron-gold markings; all the veins are clearly and broadly marked with bluish-green.

Expanse, ♂ $1\frac{7}{10}$ to ♀ $1\frac{9}{10}$ inches.

HABITAT.—Sikkim, 17,000 to 19,000 feet (Fruhstorfer). We have not seen this form, but it seems to be quite distinct; the description and figures are copies of those of the Author.

EURYMUS DUBIA.

Plate 604, figs. 6, ♂, 6a, ♀.

Colias Dubia, Elwes, Proc. Zool. Soc. 1906, p. 481, pl. 36, figs. 8, 9, ♂ ♀. Bingham, Fauna of Brit. India, Butt. ii. p. 239 (1907).

Colias Eogene, var. *Dubia*, Verity, Rhop. Palearctica, p. 247, pl. 50, figs. 23, 24 (1909).

IMAGO.—Male. Upperside dull orange-ochreous. *Forewing* with the veins blackish, costa with yellow scales, a dark dense patch of black scales on the lower

portion of the base, a narrow black spot across the end of the cell, outer marginal border broadly blackish, nearly even in width, crossed by very thin white lines, one in each interspace, in one example these lines thicken inwardly. *Hindwing* with the abdominal portion thickly irrorated with blackish scales, a broad band along costa and exterior border, its inner margin obscure and marked with a series of large whitish spots. Underside. *Forewing* bright orange-yellow, the costal and outer parts greenish, the outer portion limited by a row of black spear-shaped spots in the interspaces, decreasing in size upwards where they curve inwards on to the costa, a black spot at the end of the cell. *Hindwing* with the ground colour pale primrose-yellow, covered with green irrorations, a discal row of brown spots limiting the outer and paler portion, the inner part of the wing densely irrorated, a white spot on an orange-red small space at the end of the cell with a small pale smear on its inner side.

Female. Upperside. *Forewing* duller in colour, the veins more heavily marked, the cell spot larger, the marginal band much broader, with a middle row of spear-shaped, whitish spots. *Hindwing* entirely covered with pale blackish scales, a large orange spot at the end of the cell, a discal whorl of large whitish spots. Underside as in the male, but duller in colour. Antennæ and head in front pink, club brown, thorax and abdomen blackish, the latter with white lines beneath.

Expanse, ♂ ♀ $1\frac{4}{10}$ inches.

HABITAT.—Sikkim; Thibet.

DISTRIBUTION.—In the B. M. from Khamba Jong, 15,000 to 16,000 feet, and Shanak Valley.

EURYMUS LEECHI.

Plate 604, figs. 3, ♂, 3a, ♀.

Cylias Eogene, var. *Leechi*, Grun-Grshimailo, Horæ, Soc. Ent. Ross. 1893, p. 382. Fawcett, Proc. Zool. Soc. 1904, vol. ii. p. 140, pl. 9, figs. 10, ♂, 10a, ♀. Verity, Rhop. Palearctica, p. 248 (1909).

IMAGO.—Male. Upperside dark dull ochreous-orange colour. *Forewing* with a small patch of blue-black scales on the lower part of the base, costal margin greyish-white, a black spot closing end of cell, often linear, a broad dull black exterior marginal band, very slightly broadest at the apex, its inner edge uneven, but almost uniformly rounded, in some examples running somewhat in on the lower margin of the wing, all the veins prominent. Cilia white and crimson. *Hindwing* also with the veins prominent, the blue-black irrorations occupying the abdominal third of the wing, sometimes the abdominal half, an apical dull black band, narrowing upwards on to and along the costa, and hindwards to vein 2, sometimes a little lower, a very large pale orange-vermilion round spot at the end of the cell. Cilia white and crimson. Underside. *Forewing* inwardly suffused with pinkish-orange, the costal and exterior marginal spaces broadly greyish-green, a white-centred black spot at the end of the

cell, a row of blackish dots in the disc, limiting the outer marginal space, often more or less obsolescent, and two blackish-brown sub-apical dots on the costa. *Hindwing* entirely covered with greyish-green irrorations, a large vermilion patch at the end of the cell with two outwardly extended teeth, its inner portion containing a round white spot, a discal row of small red-brown spots.

Female. Upperside. *Forewing* paler and brighter than the male, the basal irrorations more extensive, the cell spot and outer band about the same size, but the latter contains a row of pale spots, the middle one the smallest. *Hindwing* covered with grey irrorations, a large vermilion patch at the end of the cell, sometimes with one, sometimes with two external teeth, a costal and outer marginal blackish band, broader than in the male, but its interior margin is very diffuse and obscure and contains a row of large pale spots; cilia of both wings as in the male. Underside as in the male. Palpi above, antennæ, and collar crimson, body above greenish-grey, below it is concolorous with the wings; legs crimson.

Expanse, ♂ ♀ $1\frac{7}{10}$ to 2 inches.

HABITAT.—N.E. Himalayas.

DISTRIBUTION.—Kardong Pass, Chong Ching Valley, and Native Sikkim in the B. M.

EURYMUS BERYLLA.

Plate 604, figs. 1, ♂, 1a, ♀, 2, ♀ (var. *Nina*).

Colias Berylla, Fawcett, Proc. Zool. Soc. 1904, vol. ii. p. 139, pl. 9, fig. 8, ♀. Elwes, Proc. Zool. Soc. 1906, p. 480, pl. 36, fig. 13, ♂. Bingham, Fauna of Brit. India, Butt. ii. p. 237 (1907).

Colias Nina, Fawcett, l.c. p. 140, fig. 9, ♀.

Colias Erschoffi, var. *Berylla*, Verity, Rhop. Palearctica, p. 253, pl. 50, figs. 25, 26 (1909).

IMAGO.—Male. Upperside rich bright sulphur-yellow. *Forewing* with the base thickly irrorated with black atoms, costal margin slightly irrorated, a black oval spot at end of cell, outer marginal black band broad, its inner edge irregular and somewhat sinuous, a row of more or less elongate spots of the ground colour down its centre, each being connected with the margin by a pale, slender line, the spots in the middle more or less obsolete. *Hindwing* irrorated with greenish-black, except for a broad pale band of the ground colour, its inner edge with a succession of blackish curves in the interspaces, which thicken upwards into a black sub-apical patch, outer edge with a very obscure sub-terminal band, which darkens upwards and is deep black at the apex; a large yellow spot at the end of the cell centred with orange; cilia yellow, of the hindwing posteriorly it is pink. Underside. *Forewing* yellow, the costal and outer margins green, discocellular spot and three post-discal spots black, the latter decreasing in size upwards. *Hindwing* green, a small round silvery white spot at the end of the cell, the broad yellow band of the upperside represented by a sub-marginal row of large obscure yellowish spots.

Female. Upperside. *Forewing* orange-yellow, base and upper portions irrorated with dusky black scales, markings similar to the male. *Hindwing* as in the male, but the basal and medial areas darker, almost black, the broad outer marginal band much irrorated with blackish scales. Underside as in the male, but paler. Antennæ of both sexes bright red-pink; head, thorax and abdomen blackish above.

Expanse, ♂ ♀ $2\frac{6}{10}$ to $2\frac{9}{10}$ inches.

HABITAT.—Khamba Jong, Gyantse, Tibet. Elwes says the females vary much as is usual in the genus, and *Nina* is an extreme form; both of Fawcett's types are females, and Elwes says he has received a long series from the same locality.

EURYMUS WISKOTTI.

Plate 605, figs. 1, ♂, 1a, ♀.

Colias Wiskotti, Staudinger, Berl. Ent. Zeit. 1882, p. 166, pl. 2, figs. 9, 10, ♂ ♀. Grum-Grshimailo, Rom. Mem. iv. p. 347 (1890). Bingham, Fauna of Brit. India, Butt. ii. p. 240 (1907). Verity, Rhop. Palearctica, p. 260, pl. 46, figs. 1 to 3 (1909).

Colias Wiskotti, ab. *Leuca*, Staudinger, l.c. p. 167, ♀.

Colias Wiskotti, var. *Separata*, Grum-Grshimailo, Hor. Ent. Ross. xxii. p. 305 (1888); id. Rom. Mem. iv. p. 349, pl. 4, figs. 3, a, b (1890).

Colias Wiskotti, var. *Seres*, Grum-Grshimailo, l.c. p. 353, ♀.

Colias Wiskotti, ab. *Leucotheme*, Grum-Grshimailo, l.c. p. 351, ♀.

Colias Wiskotti, var. *Sagina*, Austant. Natur. 1891, p. 99. Staudinger, Iris, 1891, p. 232.

IMAGO.—Male. Upperside pale orange-yellow. *Forewing* suffused more or less with orange, some blackish-green irrorations on the lower base, a large black spot at the end of the cell, and a very deep dull black marginal border, occupying more than a third of the wing, of a fairly uniform breadth, its inner edge scalloped above the middle and bent inward on to the costa, its lower edge angled and then runs inwards on the lower margin to its middle. *Hindwing* irrorated with blackish-green scales, a large orange, round spot at the end of the cell and a deep black marginal border, which generally stops abruptly on vein 2; the veins through the border whitish, and often this is the case also on the forewing. Underside dull whitish-yellow, very uniform in colour on both wings. *Forewing* with a black cell spot. *Hindwing* very sparsely irrorated with greenish scales, a whitish spot at the upper end of the cell. Cilia of both wings white.

Female. Upperside bright ochreous-orange. *Forewing* with the cell spot and outer band as in the male, but the band has generally three or four pale spots. *Hindwing* covered with greenish-grey irrorations, an orange cell spot, and the band about as broad as in the male, but suffused hindwards, where it has some pale streaks. Cilia orange and white. Underside as in the male, but some examples have the inner portion of the forewing suffused more or less with orange, and there are three or four lower discal black spots.

The various varieties described only differ from the type form in the tint of colour, some of the females being almost pure white. Antennæ, palpi, head and fore part of the thorax orange.

Expanse, ♂ ♀ $2\frac{4}{10}$ inches.

HABITAT.—Chitral, extending upwards into Turkistan.

EURYMUS FIELDI.

Plate 605, figs. 4, ♂, 4a, ♀, 4b, ♀ (Wet-season Brood), 4c, ♂, 4d, ♀ (Dry-season Brood), 4e, ♀ (Extreme Dry-season Brood).

Colias Fieldi, Ménétriés, Cat. Mus. Petr. Lep. i. p. 79, pl. 1, fig. 5 (1855). Wallace, Trans. Ent. Soc. 1867, p. 390. Butler, Proc. Zool. Soc. 1870, p. 126; id. 1874, p. 273. Elwes, Trans. Ent. Soc. 1880, p. 136; id. 1884, p. 7. Moore, Proc. Zool. Soc. 1882, p. 254. Doherty, Journ. As. Soc. Bengal, 1886, p. 136. Butler, Ann. Mag. Nat. Hist. 1888, p. 196. Manders, Trans. Ent. Soc. 1890, p. 534. Swinhoe, Trans. Ent. Soc. 1893, p. 308. Mackinnon and de Nicéville, Journ. Bo. Nat. Hist. Soc. 1898, p. 588. Leslie and Evans, Journ. Bo. Nat. Hist. Soc. 1903, p. 675. Bingham, Fauna of Brit. India, Butt. ii. p. 243 (1907). Verity, Rhop. Palearctica, p. 266, pl. 46, figs. 26, 27 (1909).

Colias Edusa, var. *Myrmidone*, Moore (nec Esper), Proc. Zool. Soc. 1865, p. 492. Elwes, Trans. Ent. Soc. 1884, p. 7.

Colias Edusina, Butler (nec Felder), Proc. Zool. Soc. 1886, p. 370; id. Ann. Mag. Nat. Hist. 1888, p. 196. Watson, Journ. Bo. Nat. Hist. Soc. 1897, p. 669.

Wet-season Brood (Figs. 4, ♂, 4a, ♀, 4b, ♀).

IMAGO.—Male. Upperside deep cadmium orange-yellow. *Forewing* with a small space of the lower base thickly irrorated with greenish-black scales, and a few scales of the same colour on the costa, a large pear-shaped black spot closing the end of the cell, a broad black exterior marginal border with a sinuous inner margin, slightly running in on the lower margin, and curved below the apex where the band is a little broader. *Hindwing* covered with a thin coating of greenish-black scales, except at the end of the cell, where there is a large, nearly round, space of the ground colour, and except near the inner margin of the outer black border, where there are some spots of the ground colour, decreasing in size upwards, the abdominal marginal third very thickly covered with some long soft hairs at base, the actual abdominal marginal space whitish, tinged with greenish-blue, the marginal black band of medium size, thin near the anal angle, which it does not reach, sinuous on its inner margin, thickening at the middle, narrowing at the apex and running along the costa to the base, broadening basally and with a large white patch close to the base. Underside. *Forewing* paler than it is above, of a bright ochreous-orange tinge, the costal and exterior marginal spaces tinged with green, costal line dark orange, two or three small brown spots on it near the apex, three black lower discal spots on the inner edge of the outer band, increasing in size hindwards, and a large deep black, nearly round, spot centred with white at the end of the cell.

Hindwing covered with greenish irrorations, a large white spot at the end of the cell, with a small one above it, both ringed with brownish-orange, and some suffusion of the same colour close around them; costal line brownish-orange, a brown spot in its middle, and a whorl of discal brownish-orange dots. Cilia of both wings above and below orange.

Female. Upperside. *Forewing* paler in colour, the base more thickly irrorated, the irrorations often extending to nearly the middle of the wing, the cell spot larger, the costal margin also irrorated, the exterior band much broader, its inner margin usually curving into the wing below the costa and at veins 3 and 2; five or six pale whitish spots in the middle of the band, four, sometimes five, in a whorl downwards from the costa, increasing in size hindwards, a larger spot just below the middle with a small spot below it, sometimes absent. *Hindwing* much more thickly irrorated than in the male, the cell patch similar, no spots of the ground colour in the disc, the exterior band very broad, suffused inwardly, especially so hindwards, four or five large pale spots in it near its inner margin, decreasing in size hindwards, the band is extended broadly on the costa, having a large pale space at the base. Underside as in the male. Antennæ, head and thorax in front salmon-pink. Club of antennæ brownish, rest of thorax and abdomen above greenish-black, below yellow, a patch of thickly-set light yellow scales at the base of interspace 7 on the hindwing above.

Expanse, ♂ ♀ $2\frac{1}{10}$ to $2\frac{6}{10}$ inches.

Dry-season Brood (Figs. 4c, ♂, 4d, ♀).

Male and female differ from the Wet-season form in their medium size, the outer bands on both wings above are narrower, and usually have the veins towards the apex of the forewing, whitish in the male, the general colour is paler and the irrorations lighter, on the underside both forms are alike.

Expanse, ♂ ♀ 2 to $2\frac{2}{10}$ inches.

Extreme Dry-season Brood (Fig. 4e, ♀).

Male and female small in size, the colour pale, the exterior bands very narrow, the spots below small.

Expanse, ♂ ♀ $1\frac{8}{10}$ to 2 inches.

HABITAT.—The Himalayas, extending to Assam, Upper Burma, and the Shan States.

DISTRIBUTION.—We have received it from Campbellpur, Murree, Akhor, Abbotabad, and Thundiani (Punjab), also from Mussuri, Sikkim, Mian Jani, and the Khasia Hills; Leslie and Evans record it from Chitral; Doherty from Kumaun, and Manders from the Shan States; it is in the B. M. from Goorais Valley, Scind Valley, Lahoul, Pangi, Simla, Nepal, Tibet, Bhutan, Chumbi, Naga Hills, Shan States, and from Upper Burma.

INDO-CHINESE, TIBETAN AND JAPANESE ALLIED FORMS.

- Eurymus Aias*, Colias Palæno Aias, Fruhstorfer, Iris, 1903, p. 47. Verity, Rhop. Palearctica, p. 217, pl. 40, figs. 17, 18 (1909). Habitat, Japan.
- Eurymus Marcopolo*, Colias Marcopolo, Grum-Grshimailo, Hor. Ent. Ross. xxii. p. 304 (1888); id. Rom. Mem. iv. p. 318, pl. 11, figs. 1 to 3 (1890). Verity, Rhop. Palearctica, p. 214, pl. 40, figs. 1 to 3 (1909).
- Eurymus Poliographus*, Colias Poliographus, Motschulsky, Et. Ent. ix. p. 29 (1860). Leech, Butt. China, p. 431, pl. 34, figs. 1 to 14 (1894). *Synonym*, Colias Pallens, Butler, Journ. Linn. Soc. Zool. 1866, p. 52; id. Lep. Exot. p. 89, pl. 34, fig. 3 (1872). Colias Simoda, de l'Orza, Lep. Japan, p. 16 (1869). Colias Elwesi, Butler, Ann. Mag. Nat. Hist. 1881, p. 135. Colias subaurata, Butler, l.c. p. 138. Habitat, China, Japan.
- Eurymus Sieversi*, Colias Sieversi, Grum-Grshimailo, Rom. Mem. iii. p. 397 (1887); id. iv. p. 324, pl. 3, figs. 3, a to d (1890). Verity, Rhop. Palearctica, p. 225, pl. 41, figs. 13, 14, and pl. 51, fig. 1 (1909). Habitat, N.E. Tibet.
- Eurymus Sifanica*, Colias Sifanica, Grum-Grshimailo, Hor. Ent. Ross. xxv. p. 447 (1891). Verity, Rhop. Palearctica, p. 228, pl. 41, figs. 23 to 25 (1909). Habitat, N.E. Tibet.
- Eurymus Nebulosa*, Colias Nebulosa, Oberthür, Et. Ent. xix. p. 8, pl. 8, fig. 65 (1894). Habitat, Central China.
- Eurymus Montium*, Colias Montium, Oberthür, Et. Ent. xi. p. 16, pl. 6, fig. 41, ♂ (1886). Leech, Butt. China, ii. p. 436, pl. 34, fig. 15, ♀ (1893). Habitat, W. China.
- Eurymus Cocandica*, Colias Cocandica, Erschoff, Fedtsch. 1874, p. 6, pl. 1, fig. 3, ♀. Verity, Rhop. Palearctica, p. 231, pl. 41, figs. 2, 3, and pl. 42, figs. 10 to 13 (1909). Habitat, Pamirs, Thian-Chan.
- Eurymus Maja*, Colias Maja, Grum-Grshimailo, Hor. Ent. Ross. xxv. p. 447 (1891). Verity, Rhop. Palearctica, p. 233, pl. 41, fig. 4, and pl. 42, figs. 14, 15 (1909). Habitat, Thian-Chan.
- Eurymus Grumi*, Colias Grumi, Alphéraki, Rom. Mem. ix. p. 233 (1897). Verity, Rhop. Palearctica, p. 234, pl. 41, fig. 5, and pl. 42, figs. 17, 18 (1909). Habitat, Nan-Chan.
- Eurymus Tamerlana*, Colias Tamerlana, Staudinger, Iris, x. p. 152, pl. 5, figs. 1 to 3 (1897). Habitat, N.E. Tibet.
- Eurymus Lada*, Colias Lada, Grum-Grshimailo, Hor. Ent. Ross. xxv. p. 447 (1891). Verity, Rhop. Palearctica, p. 240, pl. 43, figs. 34, 35, and pl. 44, fig. 3 (1909). Habitat, N.E. Tibet.
- Eurymus Staudingeri*, Colias Staudingeri, Alphéraki, Hor. Ent. Ross. xvi. p. 368, pl. 14, figs. 3, 4 (1881). Habitat, Thian-Chan.
- Eurymus Felderi*, Colias Felderi, Grum-Grshimailo, Hor. Ent. Ross. xxv. p. 448 (1891). Verity, Rhop. Palearctica, p. 243, pl. 44, figs. 31, 32, and pl. 45, fig. 11 (1909). Habitat, N.E. Tibet, Amdo.
- Eurymus Arida*, Colias Eogene, var. Arida, Alphéraki, Rom. Mem. v. p. 76 (1889). Verity, Rhop. Palearctica, p. 245, pl. 41, figs. 9 to 13 and pl. 43, figs. 12 to 21 (1909). Habitat, N.E. Tibet, Nan-Chan.
- Eurymus Erschoffi*, Colias Erschoffi, Alphéraki, Hor. Ent. Ross. xvi. p. 362, pl. 14, figs. 1, 2 (1881). Verity, Rhop. Palearctica, p. 253, pl. 44, figs. 25 to 27, and pl. 45, fig. 2 (1909). Habitat, Thian-Chan.
- Eurymus Diva*, Colias Diva, Grum-Grshimailo, Hor. Ent. Ross. xxv. p. 449 (1891). Verity, Rhop. Palearctica, p. 253, pl. 41, fig. 18, and pl. 45, figs. 16, 18 (1909). N.E. Tibet, Amdo.
- Eurymus Chinensis*, Colias Fieldi, var. Chinensis, Verity, Rhop. Palearctica, p. 266, pl. 46, figs. 22 to 25 (1909). Habitat, Central China, Tibet, Nan-Chan.

Sub-Family ERONIINÆ.

Genus PARERONIA.

Eronia, Hübner (part), Samml. Exot. Schmett. (1816). Doubleday, Gen. Diurn. Lep. 1847, p. 64.

Wallace, Trans. Ent. Soc. 1867, p. 387.

Valeria, Horsfield, Cat. Lep. E.I.C. p. 139 (1829). (Inadmiss., being name of the Fabrician species.)

Nepheronia, Butler, Cist. Ent. 1870, p. 38.

Pareronia, Bingham, Fauna of Brit. India, Butt. ii. p. 276 (1907).

Forewing. Costa strongly arched, apex blunt, lower margin slightly rounded near the base, slightly concave beyond its middle, exterior margin nearly straight, costal vein extending two-thirds, first and second sub-costal branches emitted close together, at one-fourth before end of cell, discocellulars oblique, veins 6 and 7 from upper end of cell, upper discocellular therefore absent, middle strongly concave, lower nearly straight, cell more than half the length of the wing, veins 8 and 9 stalked, thrown off from 7 from beyond its middle.

Hindwing with the costa and apex slightly rounded, the exterior margin evenly curved, the anal angle obtuse, cell long, nearly extending to two-thirds of the wing, pre-costal nervure short and curved upwards, costal vein much curved towards its end, discocellulars sub-equal and very oblique. Thorax hairy, abdomen long, palpi short, thickly clothed with scales, hairy beneath, legs long and slender, antennæ long, with a lengthened club.

Type, *Valeria*, Fabricius, from Java.

PARERONIA AVATAR.

Plate 606, figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀ (Wet-season Brood), 1d, ♂, 1e, ♀ (Dry-season Brood).

Eronia Avatar, Moore, Cat. Lep. E.I.C. i. p. 61, pl. 2a, fig. 1, ♂ (1857). Wallace, Trans. Ent. Soc. 1867, p. 387. de Nicéville, Journ. As. Soc. Bengal, 1881, p. 59. Elwes, Trans. Ent. Soc. 1888, p. 419. Swinhoe, Trans. Ent. Soc. 1893, p. 311.

Nepheronia Avatar, de Nicéville, Journ. As. Soc. Bengal, 1882, p. 64. Fruhstorfer, Iris, 1903, p. 101.

Pareronia Avatar, Bingham, Fauna of Brit. India, Butt. ii. p. 277 (1907).

Nepheronia Avatar Terina, Fruhstorfer, l.c.

Wet-season Brood (Figs. 1♂, 1a♀, 1b♂, 1c♀).

IMAGO.—Male. Upperside whitish, faintly tinted with blue. *Forewing*. Veins, costal band and outer marginal band black, the median vein prominently black, the band very broad at the apex, narrowing gradually to the lower angle, its inner side with long teeth running in on the veins. *Hindwing* also with black veins and a narrow black outer marginal band, its inner edge with angles on the veins. Cilia

whitish. Underside much paler and more white, of a uniform clear colour, with the veins of both wings black, the median vein of the forewing prominently black.

Female. Upperside coloured like the male, but the black sparsely spread irrorations in the clear interspaces give it a duller appearance, all the veins with black bands. *Forewing* with the costal band and outer marginal band black, the latter with a sub-marginal row of pale spots, connected more or less with the narrow pale streaks in the interspaces, these streaks narrowing upwards, two pale blackish streaks inside the cell, and one rather indistinct along the middle of the internommedian interspace. *Hindwing* with the outer third black, some pale sub-marginal spots which become obsolete hindwards, the upper four more or less connected with the pale streaks on the interspaces. Underside as in the male, but the veins are more broadly blackish. Antennæ, head, thorax and abdomen of both sexes dusky-brownish black.

Expanse, ♂ ♀ $3\frac{1}{2}$ inches.

Dry-season Brood (Figs. 1d, ♂, 1e, ♀).

Male. Coloured like the other form, only the median vein of the forewing black, the costal and outer marginal bands much narrower. *Hindwing* with the outer marginal band reduced to a black line, connecting small angular black marks on the vein ends. Underside veins less pronounced.

Female. Upperside with all the interspaces of both wings more broadly bluish-white, the black vein bands being much narrower, and the outer marginal bands very narrow. Underside with the veins paler.

Expanse, ♂ ♀ $2\frac{5}{10}$ to $2\frac{6}{10}$ inches.

HABITAT.—Sikkim, Assam, Bhutan and Burma.

DISTRIBUTION.—We have received it from the Khasia Hills, Buxar in Bhutan, Tongou and Sikkim; it is in the B. M. also from Burma and Tenasserim; some of the Tenasserim examples are somewhat darker than usual, but are otherwise not separable from the typical form.

PARERONIA HIPPIA.

Plate 607, figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀ (Wet-season Brood), 1d, ♂, 1e, ♀ (Dry-season Brood = *Gaea*), 1f, ♀ (yellow hindwing variety), 1g, ♀ (Extreme Dry-season Brood), 1h (Larva), 1i (Pupa).

Papilio Hippiæ, Fabricius, Mant. Ins. ii. p. 55 (1787). Donovan, Ins. Ind. pl. 25, fig. 1, ♀ (1800). Godart, Enc. Méth. ix. p. 193 (1819).

Eronia Hippiæ, Wallace, Trans. Ent. Soc. 1867, p. 388. Elwes, Trans. Ent. Soc. 1888, p. 419. Manders, Trans. Ent. Soc. 1890, p. 535.

Nepheronia Hippiæ, Swinhoe, Proc. Zool. Soc. 1885, p. 139. Davidson, Bell and Aitken, Journ. Bo. Nat. Hist. Soc. 1897, p. 573. Watson, id. 1897, p. 670. Mackinnon and de Nicéville, id. 1898, p. 591. de Rhé-Philipe, id. 1902, p. 492. Fruhstorfer, Iris, 1902, p. 299.

Pareronia Hippias, Bingham, Fauna of Brit. India, Butt. ii. p. 278 (1907).

Eronia Gaea, Felder, Reise Nov. Lep. ii. p. 190 (1865).

Nepheronia Gaea, de Nicéville, Journ. As. Soc. Bengal, 1885, p. 51. Swinhoe, Proc. Zool. Soc. 1885, p. 139. Elwes and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 431. Aitken, Journ. Bo. Nat. Hist. Soc. 1887, p. 41. Murray, id. 1888, p. 26. Hampson, Journ. As. Soc. Bengal, 1888, p. 363. de Nicéville, Journ. Bo. Nat. Hist. Soc. 1890, p. 387. Watson, id. 1891, p. 53. Fergusson, id. 1891, p. 445. Aitken and Comber, id. 1903, p. 51.

Eronia Valeria, Betham (nec Cramer), Journ. Bo. Nat. Hist. Soc. 1892, p. 422.

Nepheronia Hippias, ab. *Livilla*, Fruhstorfer, Iris, 1902, p. 300.

Nepheronia Hippias, ab. *Philomela*, Fruhstorfer, l.c.

Wet-season Brood (Figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀).

IMAGO.—Male. Upperside pale blue of a deeper tint than in *Avatar*; all the veins with black bands. *Forewing* with the costa broadly black, and a rather broad black band on the exterior margin, almost uniform in width, two or three sub-apical blue spots within the band and two or three below them sub-marginal, the blue stripe in the internomedian interspace with an excavation at its extremity, some of the others with minute excavations. *Hindwing* with a slightly broader black band on the exterior border, with similar excavations at the ends of the blue interspaces, the costal and abdominal spaces white. Underside much paler, the veins and outer marginal bands pale blackish, an indistinct row of large pale spots within the band on both wings.

Female. Upperside black, the markings white tinted with pale blue. *Forewing*. Cell with two streaks, the upper from base to about a third from the end, the lower from about the middle to the end; but the length of these streaks is sometimes variable, the two extending almost to the end of the cell in some examples; below and outside the cell are a series of streaks in the interspaces, in the internomedian interspace the streak is long and is split in two, and has two small sub-marginal spots near its end, the streaks shorten in length upwards, in the third interspace it consists of two elongated spots, there is also a row of more or less round sub-marginal spots, one near end of each streak, the spot at the end of the broken streak is absent. *Hindwing* with the cell and interspaces below and beyond it with broad streaks, the streak in the cell fairly filling it and split in two except at its base, the two hindermost streaks the longest, the others varying in length according to the length of the interspaces, the third and fourth being the shortest, at their ends are sub-marginal spots in an even row, the two lowest ones small, costal and abdominal spaces whitish. Underside dull whitish with the blue tint very slight, the markings all dull pale blackish, those on the forewing disposed like they are on the upperside, but the pale part of the hindwing is more extensive, the veins being thinly marked. Antennæ black; head, thorax and abdomen blackish-brown, the latter with long bluish hairs.

Expanse, ♂ ♀ $3\frac{2}{10}$ to $3\frac{8}{10}$ inches.

Dry-season Brood (Figs. 1d, ♂, 1e, ♀ = *Gaea*).

Male. Upperside paler than the Wet-season form, the black on the veins and the outer marginal bands much narrower, the sub-apical blue spots in the band much larger and more numerous. Underside coloured as in the other form, but paler, the veins thinner on the hindwing, with the exception of the sub-costal nervure, they are usually unmarked.

Female. Differs from the other form in a similar manner, the colouring being paler and the streaks broader and the sub-marginal spots much larger.

Expanse, ♂ ♀ $2\frac{5}{10}$ to $3\frac{1}{10}$ inches.

Extreme Dry-season Brood (Fig. 1g, ♀).

A small pale form, differing from the above in both sexes in its size and the paleness and thinness of its markings.

Expanse, ♂ ♀ $2\frac{2}{10}$ to $2\frac{3}{10}$ inches.

LARVA.—Davidson, Bell and Aitken say that the larvæ feed on the same plant as those of *Pingasa*, and that they differ in having the tail points more widely and squarely separated.

HABITAT.—Continental India and Burma except the Desert Tracts.

DISTRIBUTION.—We have taken both forms at Bombay, Poona, Khandalla, Alibagh, Matheran, and Purundur, all in the Bombay Presidency; we have it also from Raipur and Rangoon. Elwes reports it from Tavoy and Sikkim; de Nicéville from Calcutta and Chin Lushai; Doherty from Kumaun and Naini Tal; Hampson from the Nilgiris; Fergusson from Travancore; Mackinnon from Mussuri; de Rhé-Philippe from Lucknow; Manders from the Shan States; it is also in the B. M. from Malabar.

NOTE.—The females of all the forms have often a suffusion of dark yellow on the abdominal portion of the hindwings above.

PARERONIA PINGASA.

Plate 608, figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀ (Wet-season Brood), 1d, ♂, 1e, ♀, 1f, ♂, 1g, ♀ (Dry-season Brood), 1h (Larva), 1i (Pupa).

Eronia Pingasa, Moore, Proc. Zool. Soc. 1872, p. 565.

Nepheronia Pingasa, Butler, Proc. Zool. Soc. 1881, p. 612. Hampson, Journ. As. Soc. Bengal, 1888, p. 363. Davidson and Aitken, Journ. Bo. Nat. Hist. Soc. 1890, p. 357. Davidson, Bell and Aitken, id. 1897, p. 573, pl. 6, fig. 4 (Larva), 4a (Pupa). Fergusson, id. 1891, p. 445.

Pareronia Pingasa, Bingham (part), Fauna of Brit. India, Butt. ii. p. 280 (1907).

Nepheronia Compacta, Butler, Cist. Ent. 1874, p. 235.

Wet-season Brood (Figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀).

IMAGO.—Male. Upperside pale blue, brighter and slightly darker than in *Hippia*, veins more broadly black, especially the medial vein of the *forewing*, the costal band similar, the outer marginal band very broad, occupying more than a third of the wing, and quite spotless, the broadness of the band making the outer blue interspaces very short, especially those in front of the cell, which are very short. *Hindwing* with a similar broad outer band, the androconia scales not covering the whole band as they do in *Naraka* and *Ceylanica*, but gradually narrowing hindwards. Underside much paler and duller in colour, all the veins with pale blackish bands, a sub-marginal row of lunular blackish marks joined together, making a marginal series of large pale blue spots on both wings, edged on the extreme margin with pale blackish colour.

Female. Upperside black, with the stripes and spots disposed much as in *Hippia*, the former, however, are all very narrow. Underside as in the Wet-season form of *Hippia*.

Expanse, ♂ 3, ♀ $3\frac{2}{10}$ inches.

Dry-season Brood (Figs. 1d, ♂, 1e, ♀, 1f, ♂, 1g, ♀).

Male. Upperside coloured as in the other form, the black bands on the veins thinner, the outer marginal bands much narrower, not as a rule broader than in the Wet-season form of *Hippia*. Underside very much paler, the black stripes on the wings almost obsolete except the sub-costal and median veins of the *forewing*.

Female with the stripes and spots disposed as in the Wet-season form, but much broader, the inner portion of the *hindwing* on the underside much whiter, the lower veins almost without markings.

Expanse, ♂ $2\frac{8}{10}$, ♀ $3\frac{1}{10}$ inches.

LARVA.—Feeds on *Caparis Heyneana*, is long, cylindrical, or slightly depressed and tapering perceptibly from the head, which is large, to the tail, which ends in two short strong spines clothed with bristles; the body is clothed with very minute hairs, colour green, with a lateral row of conspicuous white spots, from the 5th to the 12th segment, and rows of smaller spots on the back.

PUPA.—Suspended by the tail and by a very long band, this is a curious object, the thoracic portion being bent back almost at right angles to the abdominal, and the head produced into a very long, sharp snout, while the wing cases form a keel nearly half an inch in depth, and so thin as to be almost transparent; colour a uniform pale watery-green. (Davidson and Aitken, Journ. Bo. Nat. Hist. Soc. 1890, p. 357.)

HABITAT.—South India.

DISTRIBUTION.—We have it from the Nilgiris, Malabar and Kanara Districts, and Fergusson recorded it from Travancore.

PARERONIA NARAKA.

Plate 609, figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀ (Wet-season Brood), 1d, ♂, 1e, ♀, 1f, ♂, 1g, ♀ (Dry-season Brood).

Eronia Naraka, Moore, Proc. Zool. Soc. 1877, p. 591.

Eronia Valeria, var. *Naraka*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1880, p. 237; id. 1881, p. 252.

Pareronia Pingasa, Bingham (part), Fauna of Brit. India, Butt. ii. p. 280 (1907).

Wet-season Brood (Figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀).

IMAGO.—Male. Upperside pale blue, a little darker than in *Pingasa* and of a clearer colour. *Forewing* with the veins not so broadly black, and the marginal band not much more than half as broad; always with one sub-apical pale small spot in it, sometimes with two, three or four minute dots in a row following, consequently the blue interspaces beyond the cell are much longer. *Hindwing* with the black veins much as in *Pingasa*, the exterior marginal black border quite as broad at the apex, but not nearly so even in width, narrowing gradually hindwards, the androconia scales covering the entire band. Underside much paler, whitish and dull in colour, with all the veins as on the upperside, but of a pale blackish colour, the sub-marginal row of blackish lunular spots and markings similar.

Female. Very different to the female of *Pingasa*, the vein stripes and outer border blackish-brown and not deep black as in that species, the pale interspaces broader; on the underside the *forewing* is similar, but the *hindwing* has no vein stripes, and there is a broad, outer marginal blackish border, containing a row of pale sub-marginal lunules.

Dry-season Brood (Figs. 1d, ♂, 1e, ♀, 1f, ♂, 1g, ♀).

Male. Upperside similarly coloured. *Forewing* with the black vein markings thinner, the exterior marginal black band much less at the apex and narrowing hindwards, the spots within it larger. Underside of a brighter bluish-white colour. *Forewing* with the vein markings similar, but narrower. *Hindwing* without black vein markings, the outer marginal markings on both wings, faintly indicated.

Female. Upperside with all the pale stripes broader, the spots larger, those on the *forewing* with a slight blue tint. Underside. *Forewing* similar. *Hindwing* without vein markings and with a broad blackish outer marginal border, diffuse on its inner side; both wings with thin, sub-marginal pale lunular marks.

Expanse, ♂ $2\frac{9}{10}$, ♀ $3\frac{1}{10}$ inches.

HABITAT.—South Andaman Islands.

DISTRIBUTION.—In our collection and in the B. M. from Port Blair.

PARERONIA CEYLANICA.

Plate 610, figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀ (Wet-season Brood), 1d, ♂, 1e, ♀, 1f, ♂, 1g, ♀ (Dry-season Brood).

Eronia Ceylanica, Felder, Reise Nov. Lep. ii. p. 191, ♂ only (1865). Wallace, Trans. Ent. Soc. 1867, p. 388.

Nepheronia Ceylanica, Moore, Lep. Ceylon, i. p. 138 (1881). Manders, Journ. Bo. Nat. Hist. Soc. 1904, p. 79.

Pareronia Ceylanica, Bingham (part), Fauna of Brit. India, Butt. ii. p. 281 (1907).

Wet-season Brood (Figs. 1 ♂, 1a, ♀, 1b, ♂, 1c, ♀).

IMAGO.—Male. Upperside bright pale blue. *Forewing* much as in *Pingasa*, the median and lower vein as broadly black-striped as the same form of that species, the outer marginal band not nearly so broad, but fairly uniform in width hindwards, and generally containing a row of small blue streaks, the apical and medial streaks the largest. *Hindwing* with the exterior band broader than in the *forewing* and very uniform, the veins about as broadly black as in *Pingasa*, the usual white costal space with blue at its base, the next one below it tipped with white, the androconia scales covering the entire outer band. Underside bright pale bluish, of a different tint to any of the preceding species, the sub-costal and median veins rather broadly black, as also veins 1, 2 and 3, all three ending with large black sub-marginal patches, outer band space darker than the rest of the wing enclosing a series of large pale spots. *Hindwing* almost clear, the upper vein markings showing slightly through the wing, and near the outer margin is a series of pale greyish lunules.

Female. Upperside dark blackish-brown, the sub-marginal spots smaller than usual, and all the streaks in the interspaces on both wings thin, of a greyish-white colour and more or less faintly indicated. Underside of a uniform dull pale blackish-brown colour, the spots larger, the streaks broader and rather more clearly indicated than they are above.

Expanse, ♂ $3\frac{2}{10}$, ♀ $3\frac{3}{10}$ inches.

Dry-season Brood (Figs. 1d, ♂, 1e, ♀, 1f, ♂, 1g, ♀).

Male. Similar to the other form, on the uppersides the veins are much less heavily marked, and the outer band is much narrower and tapers somewhat hindwards on the forewing, on the underside it is duller in colour, the forewing has normal vein markings, and the patches at the ends of the veins 2, 3 and 4 are small. *Hindwing* without markings.

Female. Upperside with the stripes much broader and the spots larger. Underside whitish faintly tinged with blue, the stripes on both wings very broad, the inner

portion of the forewing blackish-brown. *Hindwing* with the whitish interspaces very broad, the veins with bluish-grey thin stripes and the outer border broadly bluish-grey with a sub-marginal row of large whitish spots.

Expanse, ♂ $2\frac{8}{10}$, ♀ $3\frac{2}{10}$ inches.

HABITAT.—Ceylon.

NOTE.—The male figure is from Felder's type, kindly lent me by the Hon. Walter Rothschild; the Dry-season female figure is from an example in the Felder collection, but is not his female type.

PARERONIA FRATERNA.

Plate 611, figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀ (Wet-season Brood), 1d, ♂, 1e, ♀, 1f, ♂, 1g, ♀ (Dry-season Brood).

Nepheronia Fraterna, Moore, Lep. Ceylon, i. p. 139, pl. 54, figs. 3, ♂, 3a, ♀ (1881). Hampson, Journ. As. Soc. Bengal, 1888, p. 363. Fergusson, Journ. Bo. Nat. Hist. Soc. 1891, p. 444. Davidson, Bell and Aitken, id. 1897, p. 573.

Nepheronia Ceylanica, Bingham (part), Fauna of Brit. India, Butt. ii. p. 281 (1907).

Eronia Ceylanica, Felder, Reise Nov. Lep. ii. p. 191 (♀ only), (1865).

Nepheronia Speculifera, Moore, Lep. Ceylon, i. p. 139 (1881).

Wet-season Brood (Figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀).

IMAGO.—Male. Upperside darker and brighter blue than in *Ceylanica*, markings similar, the veins not nearly so broadly black, and the outer marginal band narrower. Underside similar, but the *hindwing* is immaculate.

Female very different to the Wet-season form of *Ceylanica*. Upperside deep black with a faint blue tinge, markings very much as in the Wet-season form of the female of *Hippia*, but all the pale stripes and spots tinged with blue; the lower cell stripe on the forewing club-shaped and very short, the discal stripe in the second interspace rounded at both ends, and the cell stripe of the hindwings with a distinct black line dividing it. Underside very different to any other Indian species of this genus; it is strongly blue-tinged. *Forewing* with the inner ground colour black, the stripes broad, the sub-apical stripes long and running into the sub-marginal spots, the general colour of the costal band and of the apical portion whitish tinged with blue, the marginal space is of the same colour, narrowing hindwards, and the cell stripe is outwardly split into three parts. *Hindwing* with very faint markings and with a series of large whitish lunulate sub-marginal spots.

Expanse, ♂ $2\frac{8}{10}$, ♀ $3\frac{1}{10}$ inches.

Dry-season Brood (Figs. 1d, ♂, 1e, ♀, 1f, ♂, 1g, ♀).

Male. Upper and underside like the Wet-season form, but the veins are more thinly marked and the exterior bands above are narrower.

Female. Less tinged with blue above, all the stripes much broader and the spots larger, the cell stripe of the forewing split into three parts joined together basally, the cell stripe of the hindwing without the dividing line. Underside as in the other form, but paler.

Expanse, ♂ $2\frac{4}{10}$, ♀ $3\frac{1}{10}$ inches.

HABITAT. — Ceylon and South India.

DISTRIBUTION.—We have both sexes of the Dry-season form, as figured, from Trincomali, Ceylon, and both sexes of the Wet-season form, as figured, from Madras; Fergusson reports it from Travancore, and Davidson, Bell and Aitken from Canara.

NOTE.—Bingham makes *Fraterna* a Dry-season form of *Ceylanica*, but the latter is not an Indian insect, the South Indian specimens of *Fraterna* are absolutely identical with the Ceylon examples, and with Moore's type-specimen which came from Ceylon; there are in our collection and in the B. M. both forms from Ceylon as well as from Southern India.

The figure of the Dry-season female is from Felder's type of his female *Ceylanica*, which corresponds with his description.

INDO-MALAYAN ALLIED SPECIES.

Pareronia Phocæa, *Eronia Phocæa*, Felder, Wien, Ent. Mon. v. p. 299 (1861); id. Reise Nov. Lep. pl. 27, figs. 5, 6 (1865). Habitat, Mindanao, Philippines.

Pareronia Valeria, *Eronia Valeria*, Wallace, Trans. Ent. Soc. 1867, p. 388. *Pontia Valeria*, Horsfield, Cat. Lep. E.I.C. p. 139 (1829). Habitat, Java.

Pareronia Lutescens, *Nepheronia Lutescens*, Butler, Cist. Ent. ii. p. 431 (1879). Habitat, Borneo.

Pareronia Octaviæ, *Eronia Octaviæ*, Snellen, Tijds. voor Ent. xxxvii. p. 68, pl. 3, fig. 3 (1895). Habitat, Tanah-Djampier.

Pareronia Niasica, *Nepheronia Valeria Niasica*, Fruhstorfer, Berl. Ent. Zeit. 1899, p. 34. Habitat, Nias.

Pareronia Palawana, *Nepheronia Valeria Palawana*, Fruhstorfer, l.c. Habitat, Palawan, Philippines.

Pareronia Leona, *Nepheronia Valeria Leona*, Fruhstorfer, Iris, 1903, p. 97. Habitat, West Java.

Pareronia Persides, *Nepheronia Valeria Persides*, Fruhstorfer, Iris, 1903, p. 98. Habitat, Tonkin.

Pareronia Oder, *Nepheronia Hippiæ*, sub sp. Oder, Fruhstorfer, Soc. Ent. 1903, p. 42. Habitat, Tonkin, Siam.

Pareronia Kangeana, *Nepheronia Valeria Kangeana*, Fruhstorfer, Sep-Abzüge aus Soc. Ent. Jahrg. 1903, p. 124; id. Stett. Ent. Zeit. 1904, p. 347. Habitat, Java.

Family LYCÆNIDÆ.

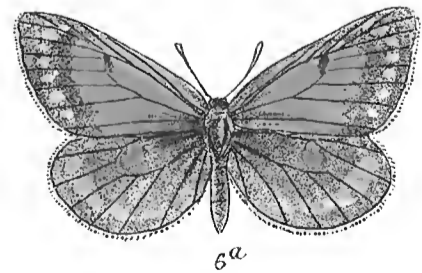
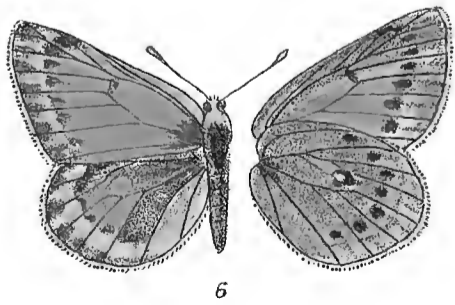
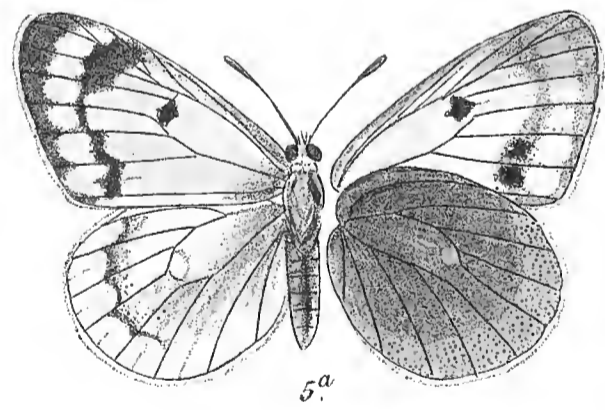
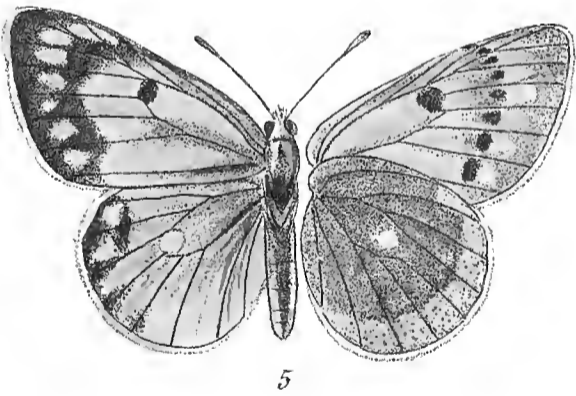
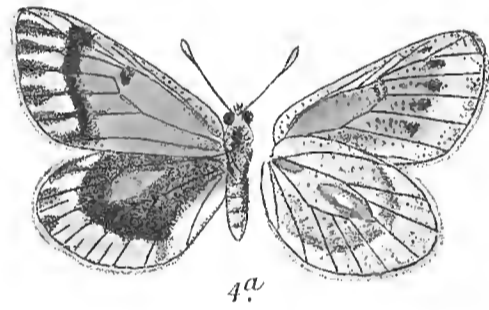
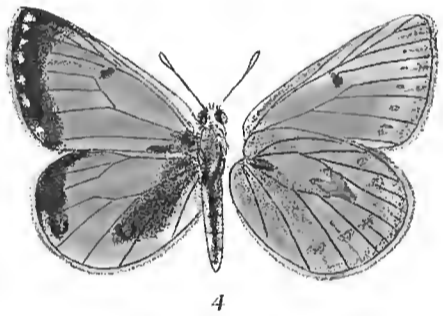
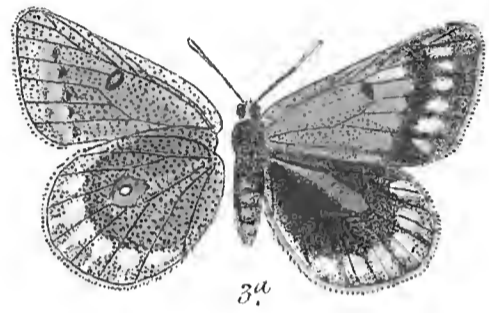
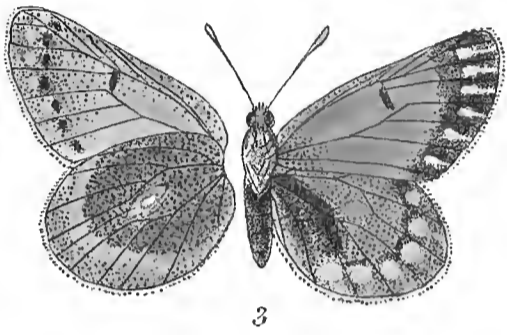
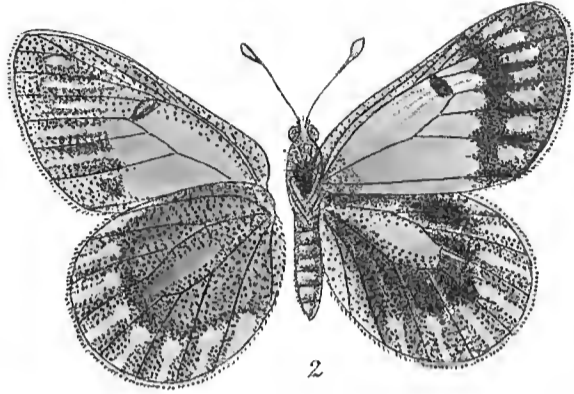
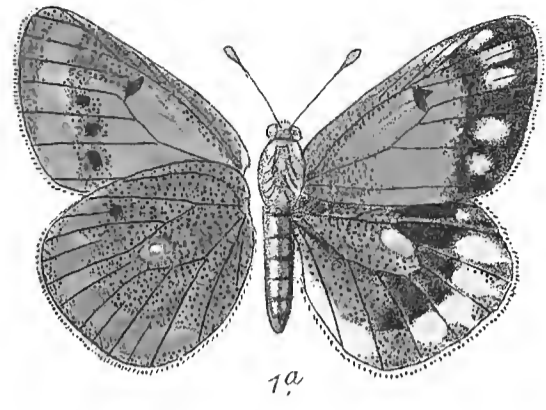
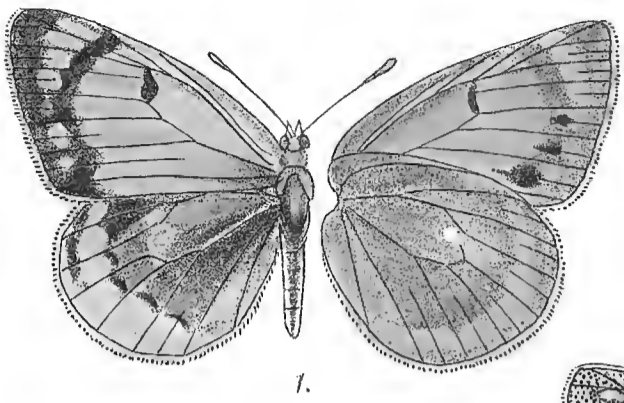
Butterflies of small size, and mostly of very beautiful colour, the females are almost always of a duller colour than the males, browns and blacks usually; in size they include the smallest known butterflies, some species being not more than half an inch in expanse of wings; often the species occur in very great quantities; one species, *Liphyra brassolis*, Westwood, is as aberrant in size as it is in other characters, being over three inches in expanse; the larvæ and eggs of the *Lycænidæ* are very distinctive and denote their reality as a well-defined and separate family of the Rhopalocera. Mr. W. Doherty, who gave much time to the study of the eggs of butterflies, has described in detail the eggs of this family, and attempted a division of sub-families based on their shape and peculiarities; and his paper, published in the Journal of the Asiatic Society of Bengal, 1886, p. 110, is worth careful study and is very instructive; he divides the family into six sub-families, and his sub-divisions correspond very closely with those of Bingham, published in the Fauna of British India, Butt. ii. p. 284 (1907), which are very carefully worked out on the wing venation and general construction of the different groups.

The larvæ of the *Lycænidæ* have had much attention paid them; de Nicéville, Davidson, Bell, Aitken and Bingham in India, and Trimen in Africa have very carefully studied the life history of many species; de Nicéville says (p. 7) that some of the larvæ are furnished with certain organs which are found in no other larvæ of Lepidoptera; this organ consists of an oval opening on the dorsal line of the eleventh segment, with lips like a mouth; these lips can at the will of the larvæ be somewhat protruded, and a drop of sweet liquid exuded. On the twelfth segment are two other organs, one on each side, in the sub-dorsal region. In the genus *Curetis*, Hübner, which does not possess the mouth-like organ on the eleventh segment, these two organs are of very great size and are much more developed than in any other species. Each organ consists of a tall pillar, from which, when the larva is touched or frightened, is instantly protruded a long tentacle furnished at its head with a brush of long parti-coloured hairs as long as itself; these hairs open out into a rosette, and the tentacle is whorled round with immense rapidity, producing a curious effect, probably to frighten away their enemies, the worst of which are ichneumon flies; they are not attended by ants, not having the organ on the eleventh segment which exudes the sweet liquid; in those forms that have this organ the larvæ are so attended, who, in return for the food they obtain from the larvæ, act as their most efficient guardians; the ants gently stroke the larvæ with their antennæ and feed on the fluid exuded, and they will furiously attack anything interfering with these larvæ; de Nicéville gives a very

interesting description of his and Mrs. Wylly's observations on this subject in the Journal of the Bombay Natural History Society, vol. iii. p. 164 (1888). The larvæ of some species are carnivorous. In a note by Thwaites, he says it is difficult to realise that the larvæ of some of these lovely Lycænidæ, such as *Amblypodia*, etc., are carnivorous or even cannibal in their habits, and do not hesitate to eat their own brethren of the same brood when any of the latter are commencing their change into the inactive chrysalis state, with their consequent inability to protect themselves from their voracious kindred, who devour them with avidity. de Nicéville says (p. 55) that Green (who is a very careful observer) states that the larvæ of *Spalgis epius* are carnivorous; and James L. Courtice, in Ent. Mo. Mag. 1865, p. 45, gives an account of the cannibalism of *Zephyrus quercus*; he says, "On the 27th May, one had changed to chrysalis in a corner of the shade, and I observed a larva attached to the tail end of it, and evidently very busily engaged. I disturbed him, and found that he had not only eaten off the end of the chrysalis, but had cleaned the contents of it right out; and what still more astonished me was that, after being disturbed, he returned resolutely to the attack, and finished up the greater part of the pupa shell."

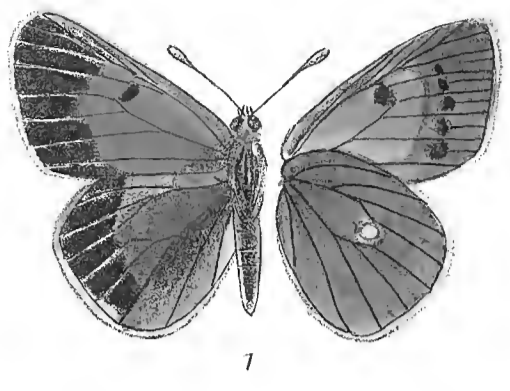
With reference to the pupæ, de Nicéville says they are usually attached by the cremaster which forms the terminal portion of the pupa, and is furnished with minute hooks for attachment to the pad of silk previously spun for that purpose by the larva, and by a silken girth round the middle of the body to whatever surface the larvæ choose on which to perform their transformation; in some forms, however, the pupæ are freely suspended by the tail, and Trimen notes the same, remarking that the pupæ of some Lycænidæ are attached by the tail only in a fixed horizontal or slightly inclined position. Some forms of pupæ are hidden in the ground, Trimen says, but de Nicéville remarks that this is certainly true in the case of some Indian species, the larvæ of which are attended by ants, as the latter drive the larvæ into their nest, when they turn to pupæ in the usual way, being attached to the trunk of the tree by a tail or a girdle, the ants having constructed a temporary nest around the base of the tree.

The butterflies of this family are often found in open meadow or grass land, but by far the greater number of forms frequent trees and bushes, especially open paths and the edges of forests; the males are sometimes to be seen in great numbers on damp sandy ground and the sides of streams, sucking up the moisture, and they have the habit of rubbing the hindwings one over the other, when first settling, the motion being apparently more or less rotary. Trimen notes on the subject: "This curious habit is practised by every member of the family that I have watched when settled, and it seems not improbable that the movement may serve to accentuate their ornaments, either in rivalry or menace." Scudder thinks that the action may cause a stridulation which, though inaudible to our ears, may be heard by insects; most of the Lycænidæ close their wings when at rest, as do other butterflies, but this is not

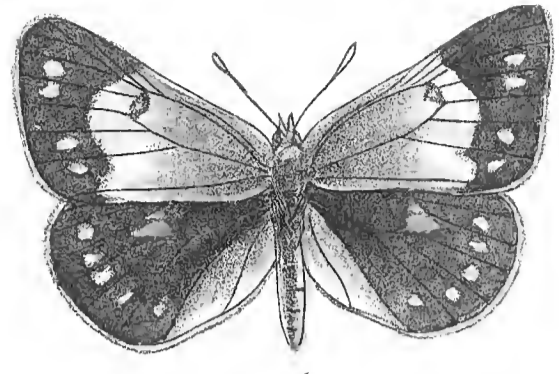


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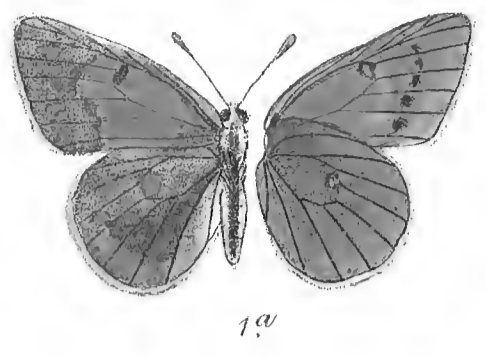
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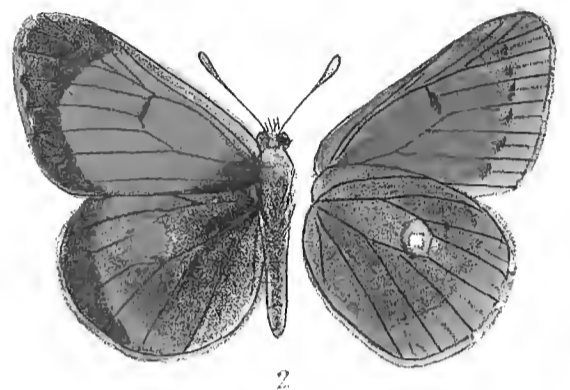
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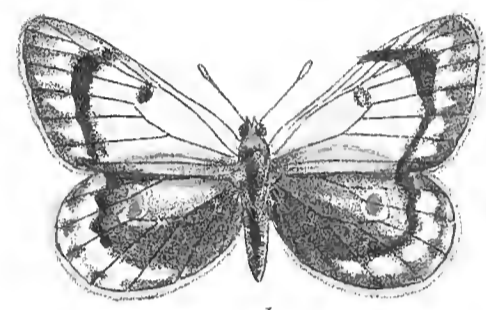
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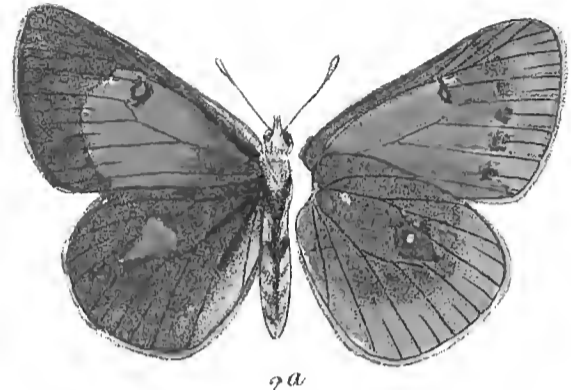
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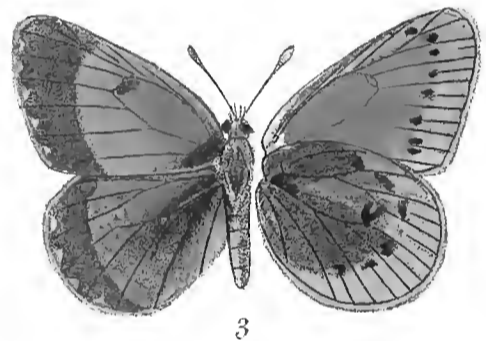
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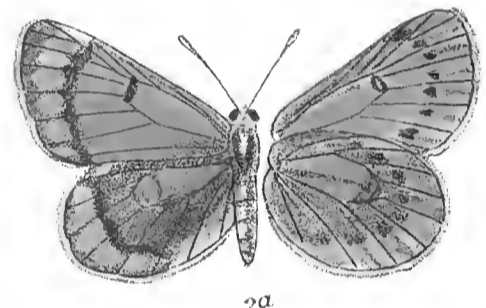
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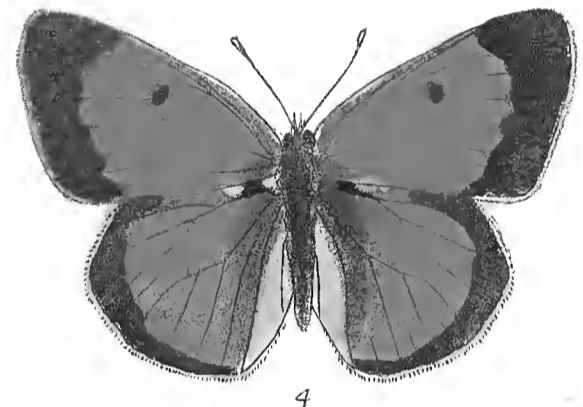
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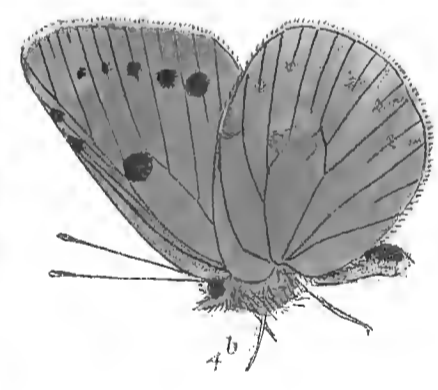
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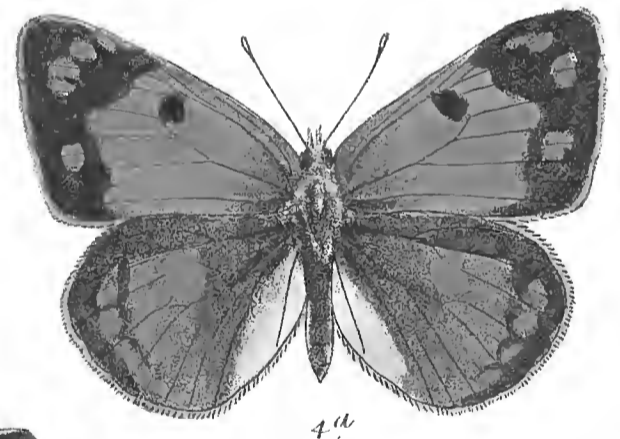
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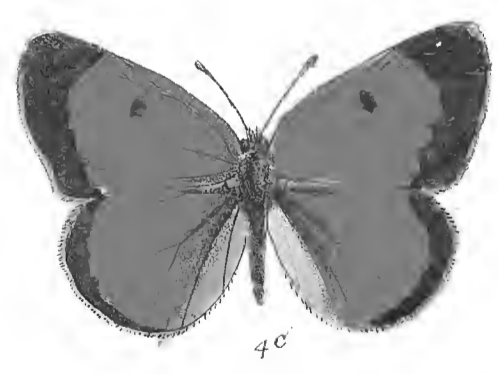
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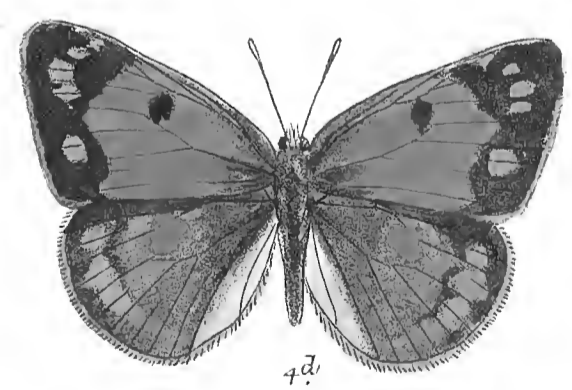
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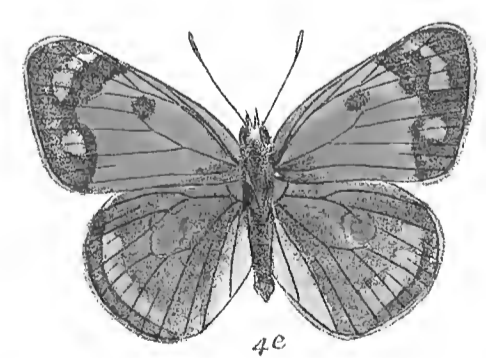
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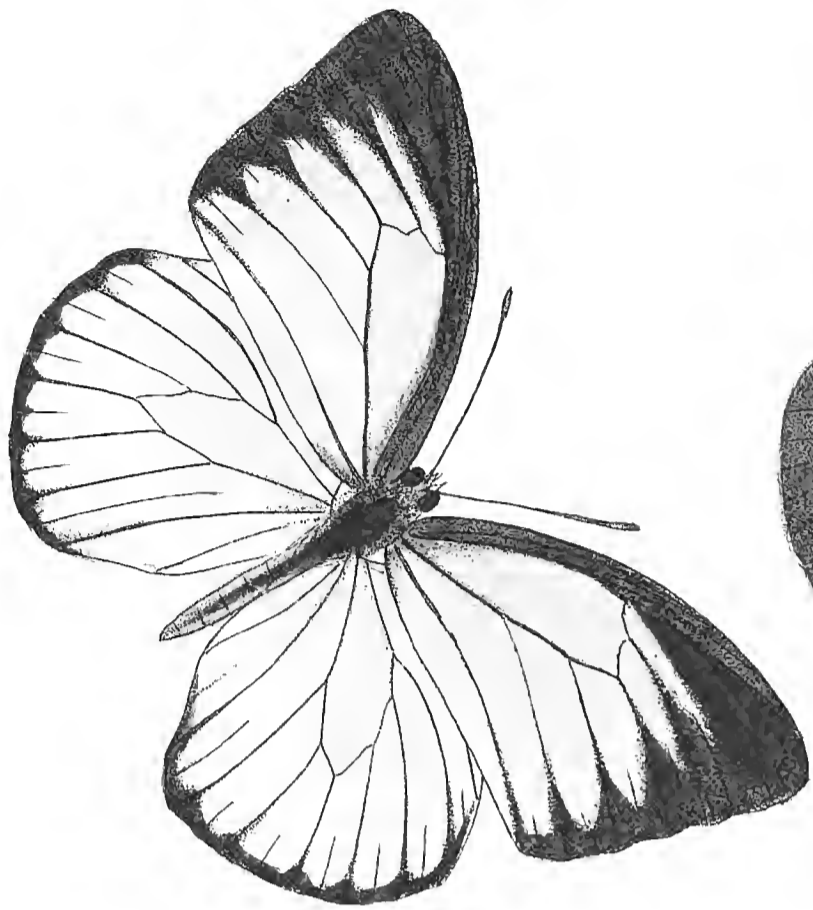


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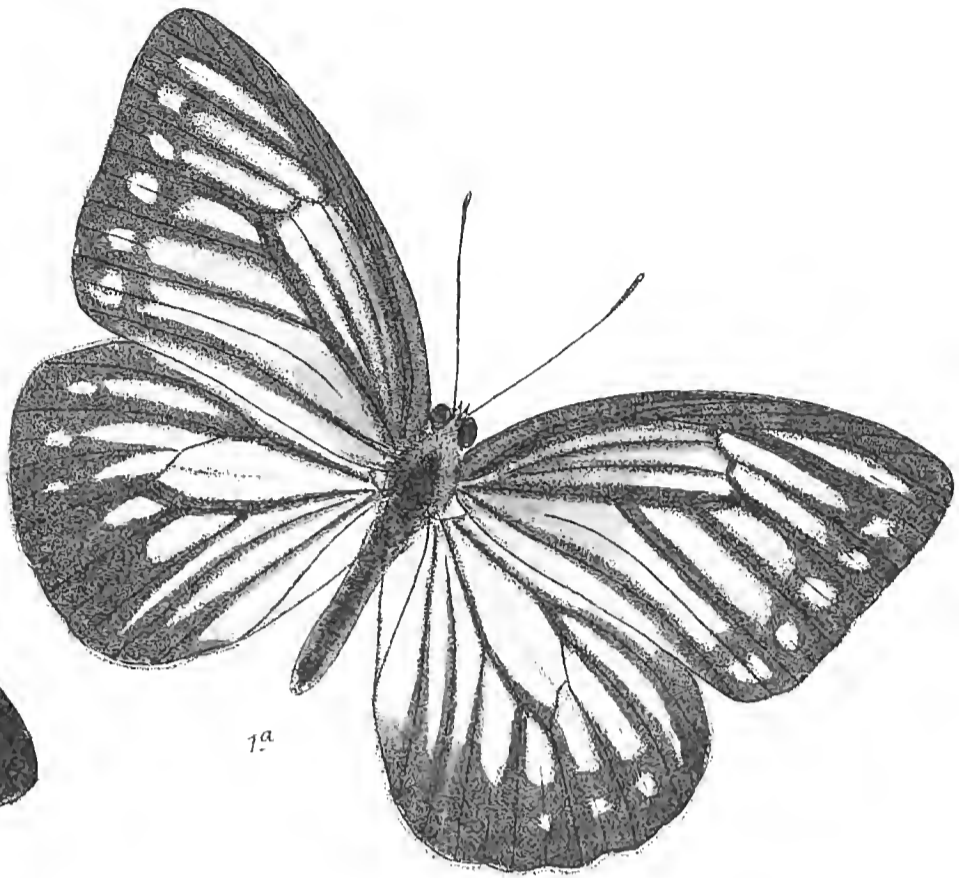
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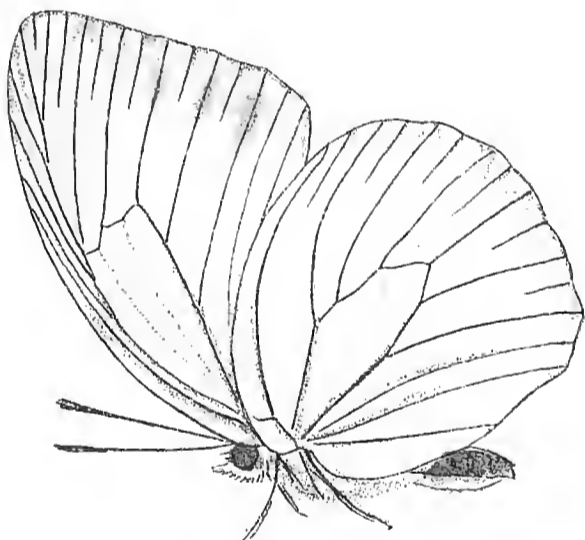
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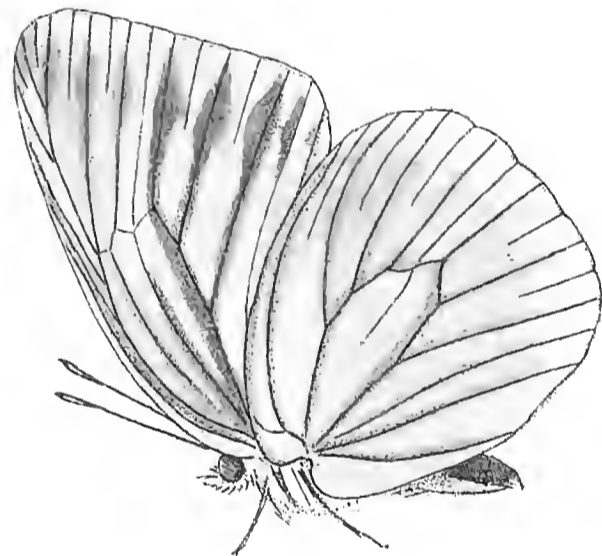
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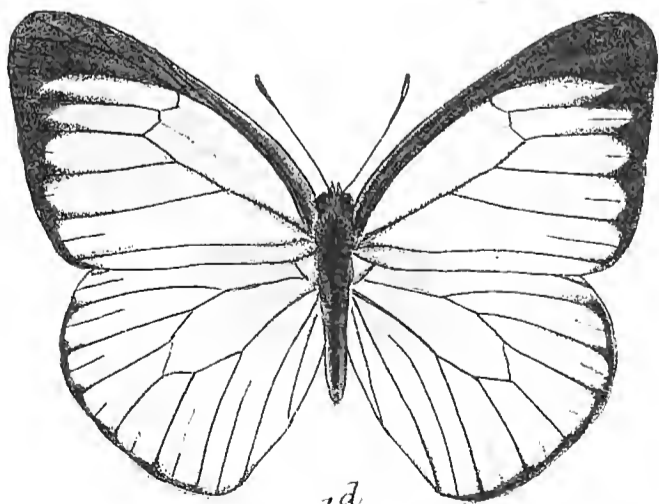
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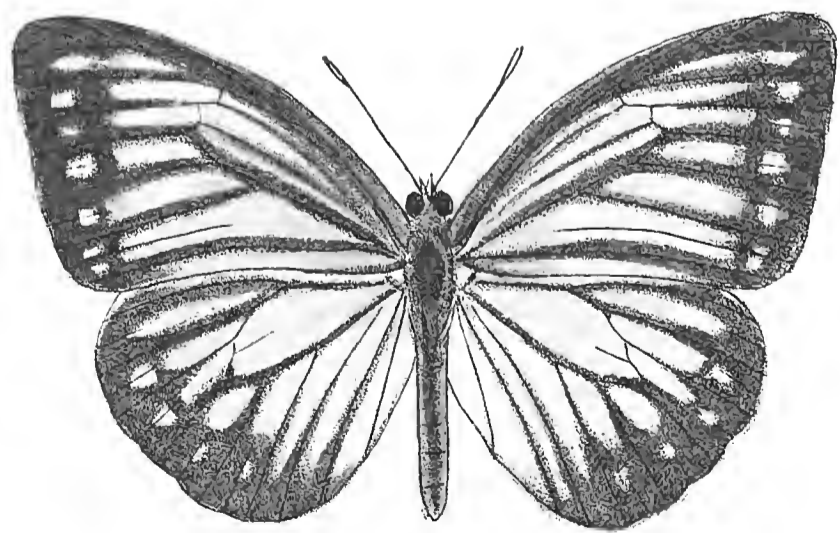
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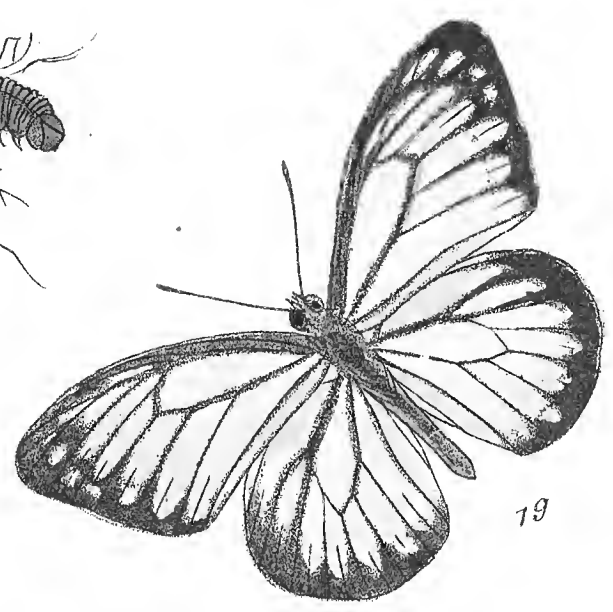
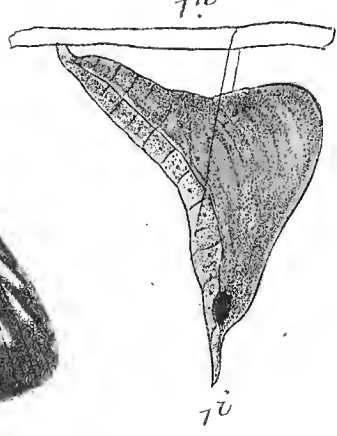
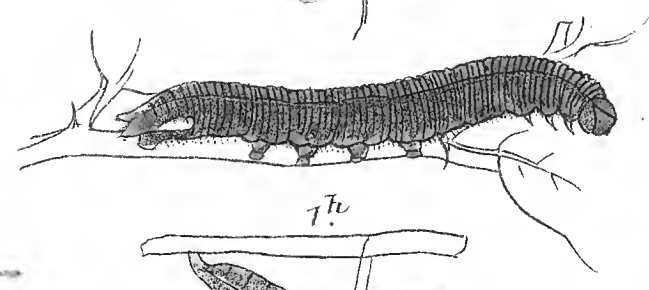
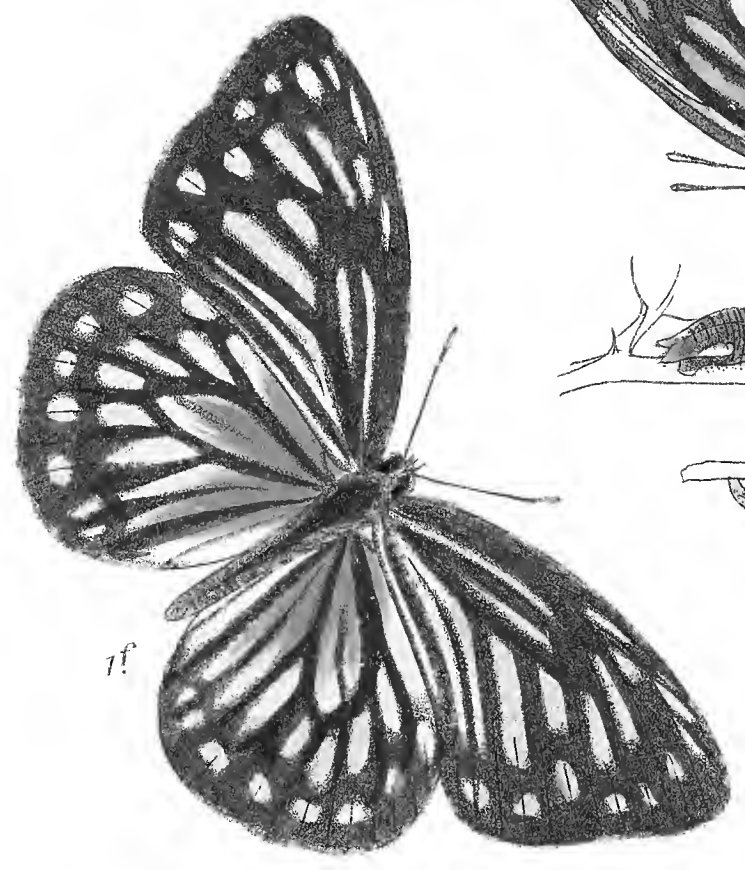
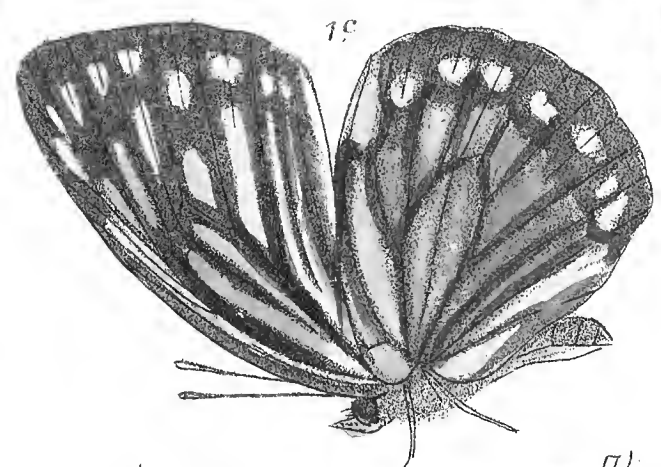
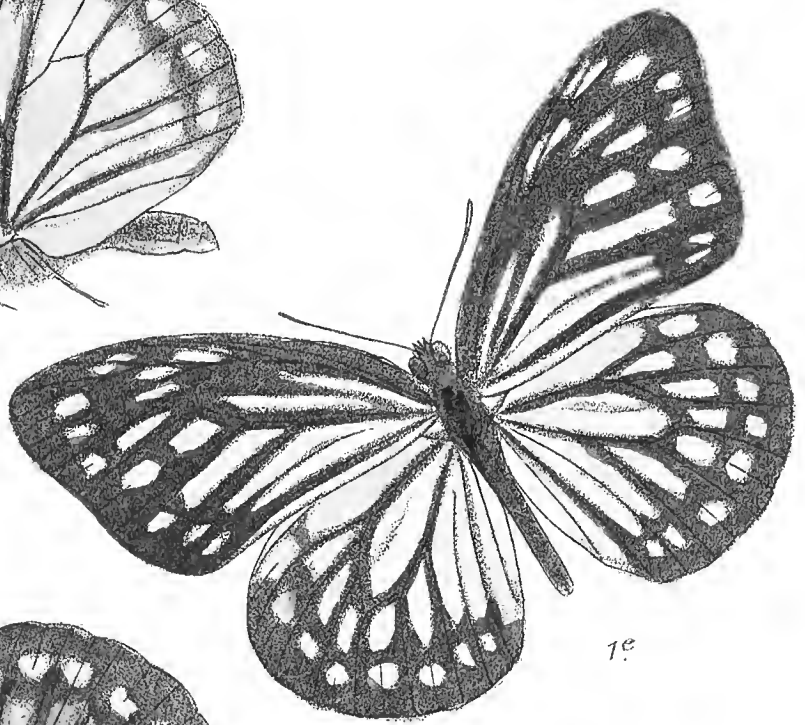
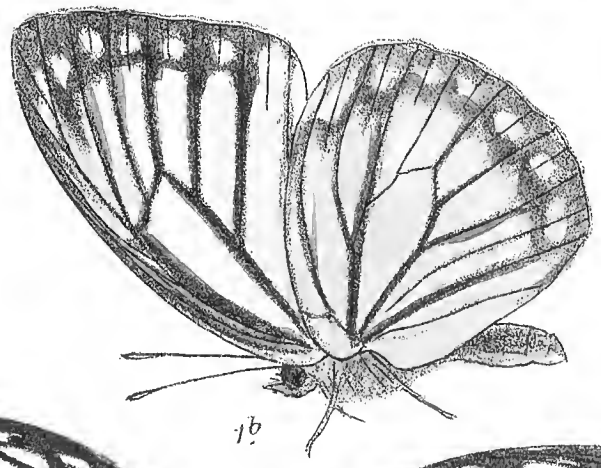
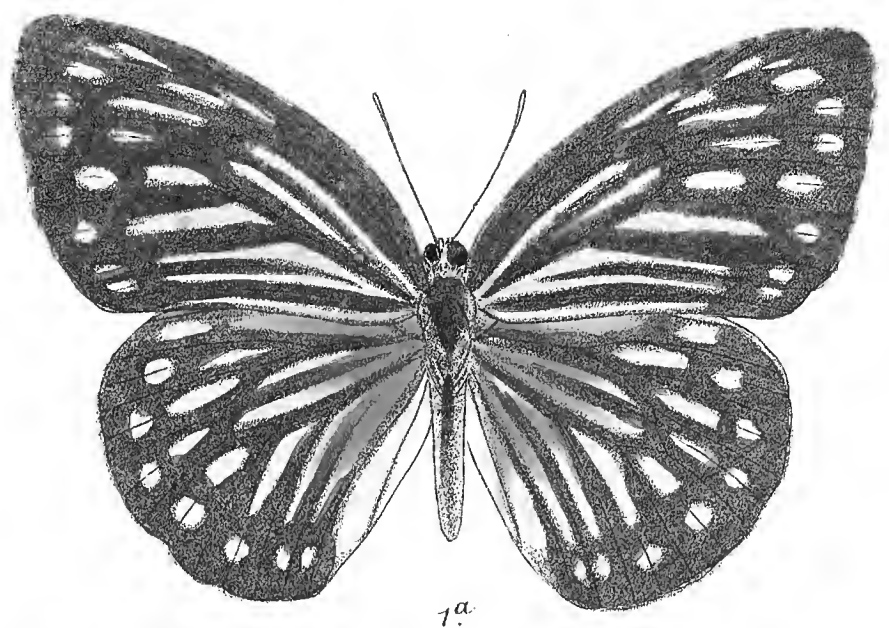
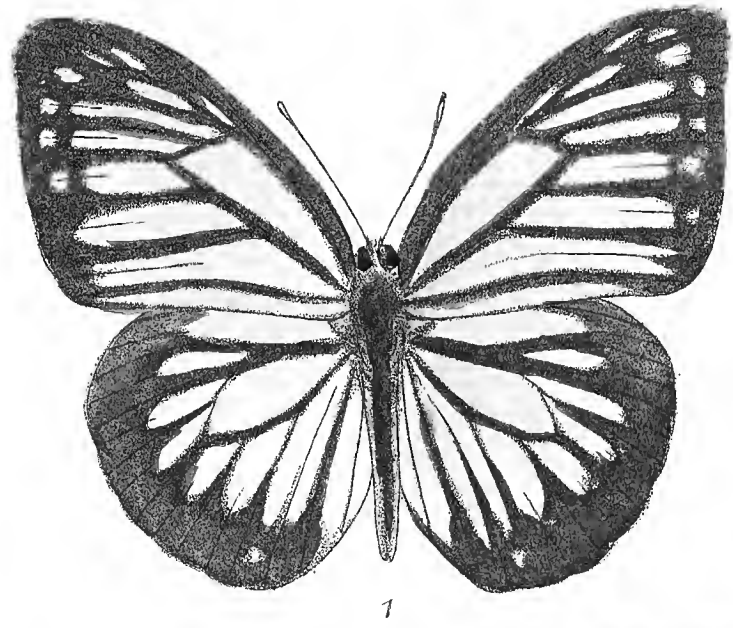


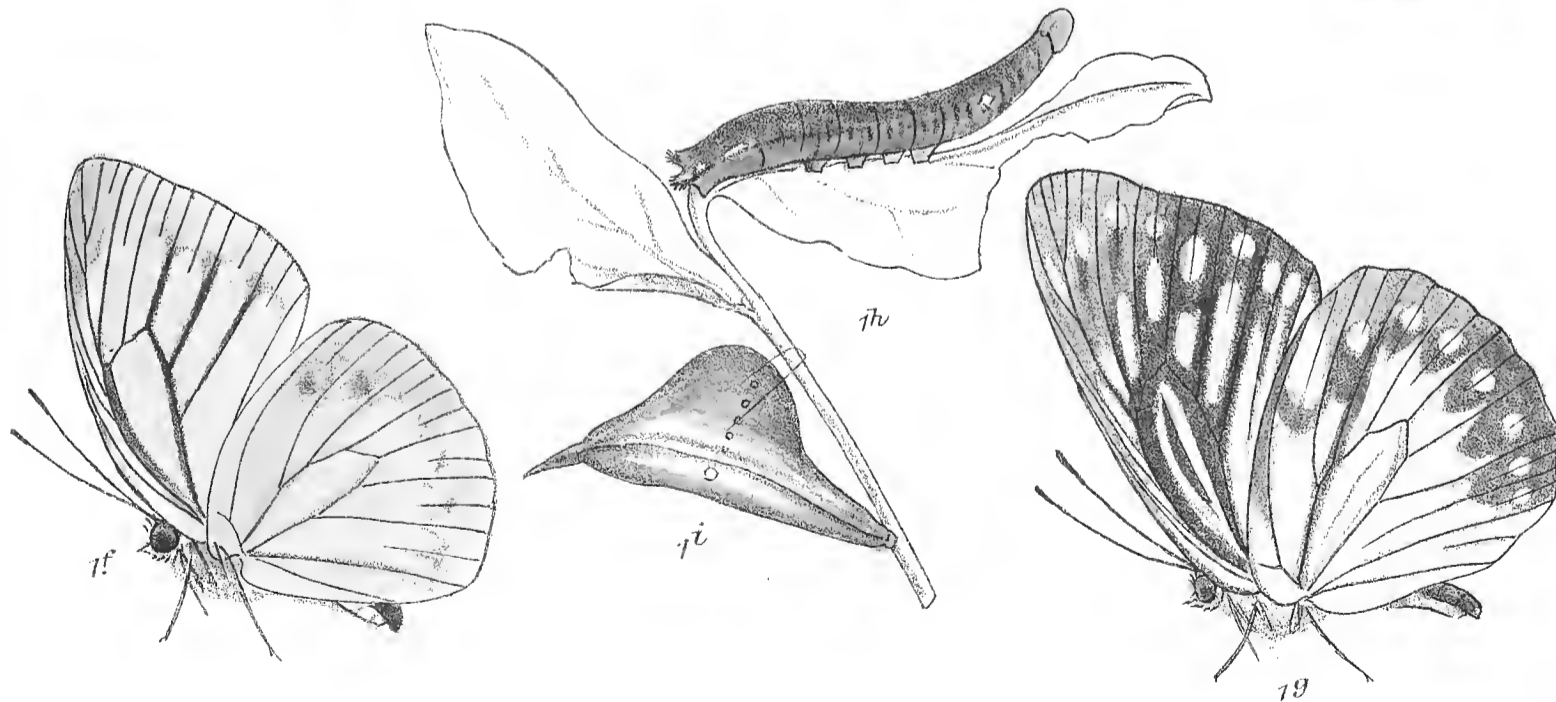
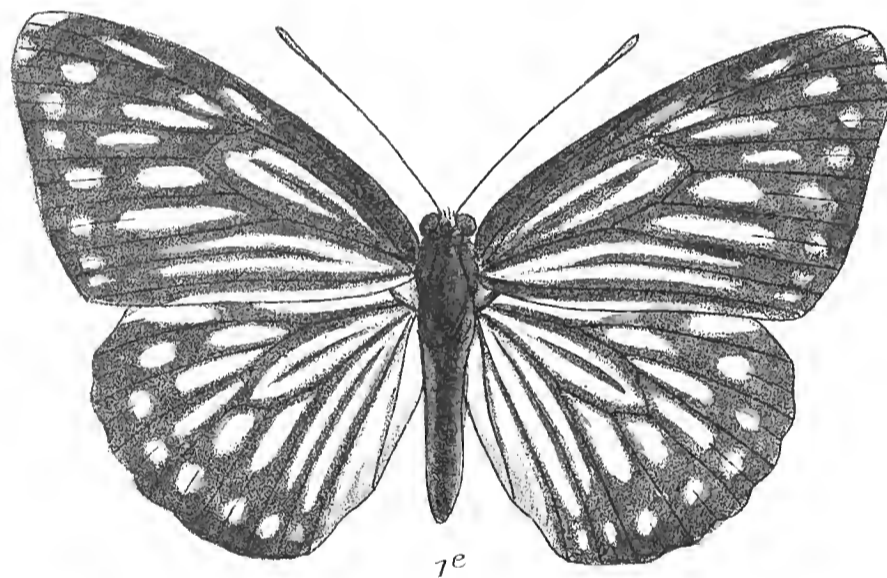
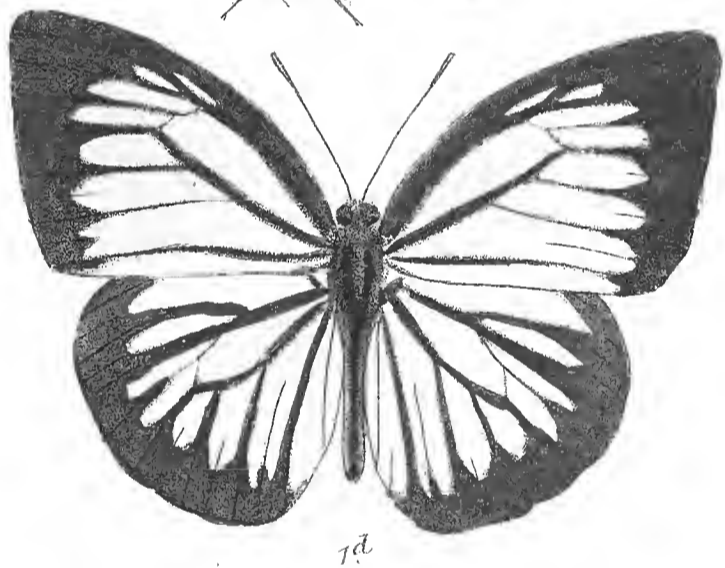
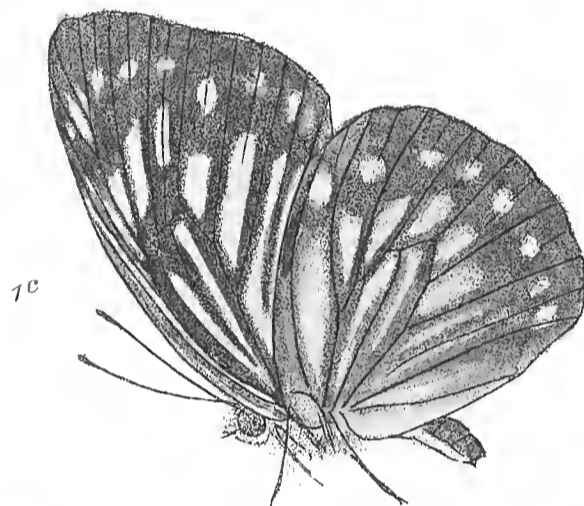
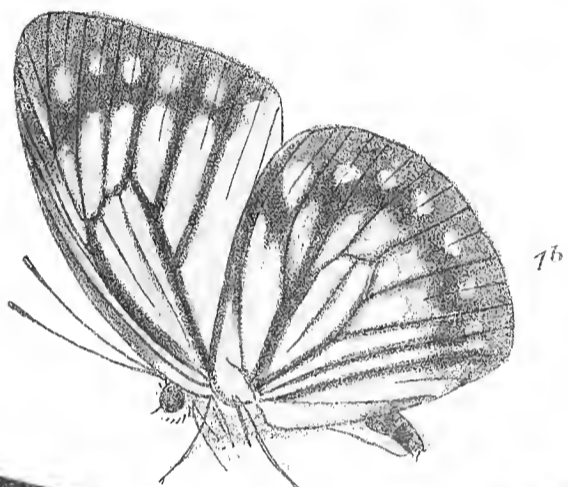
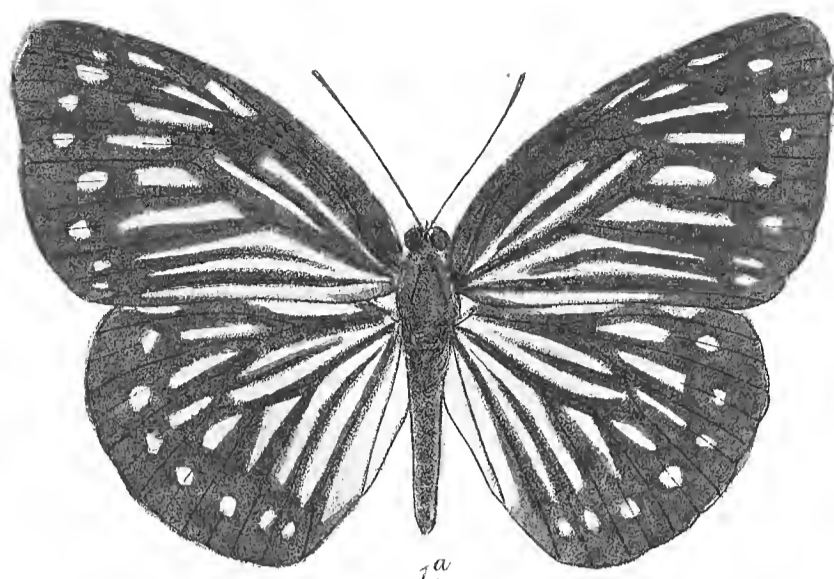
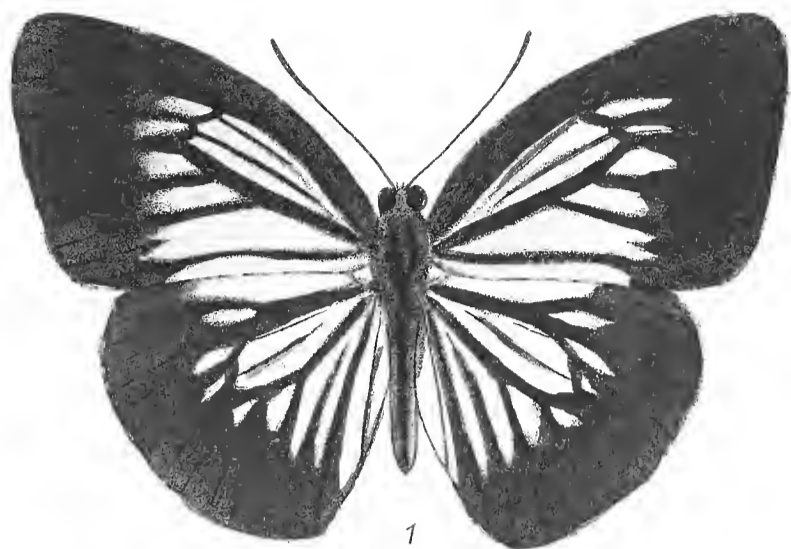
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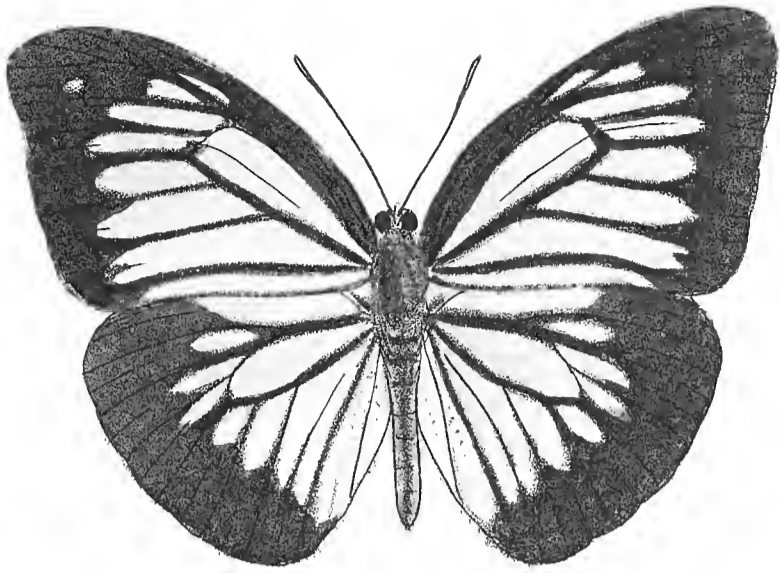




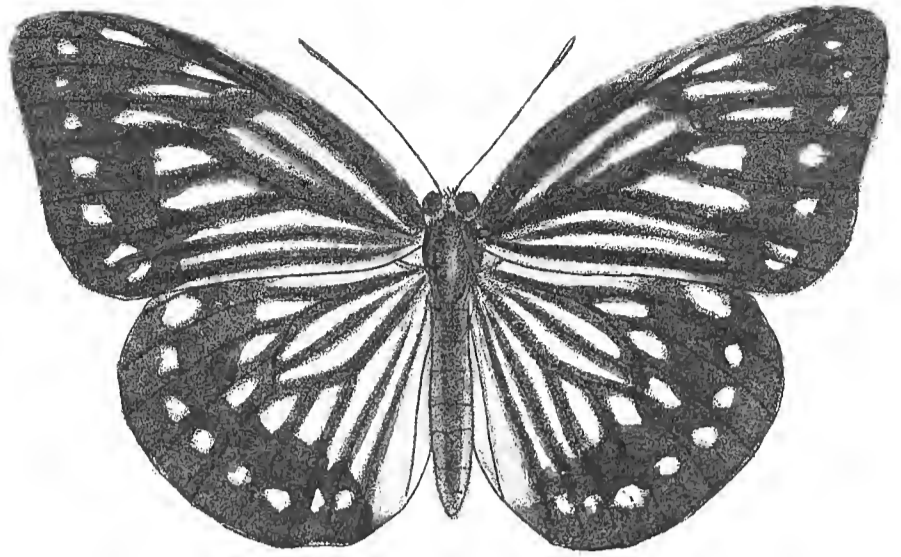
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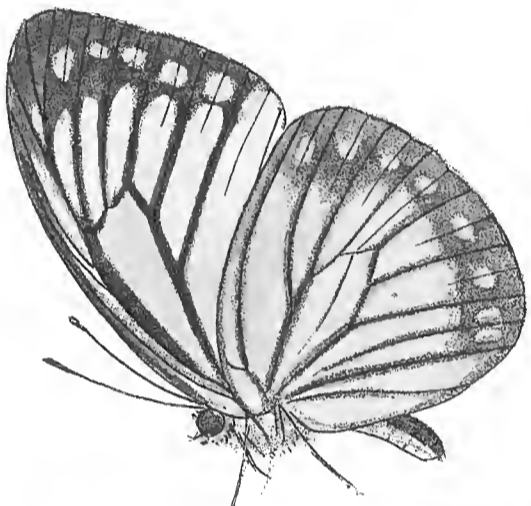
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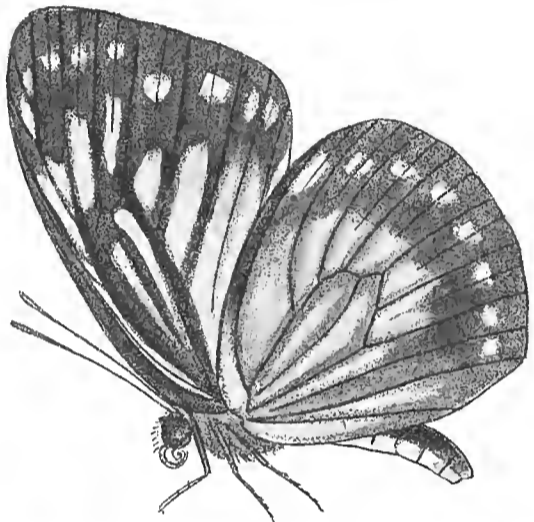
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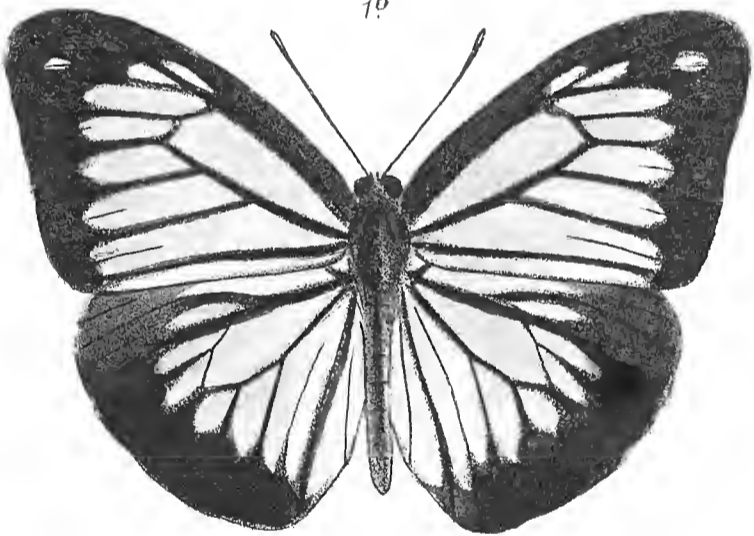
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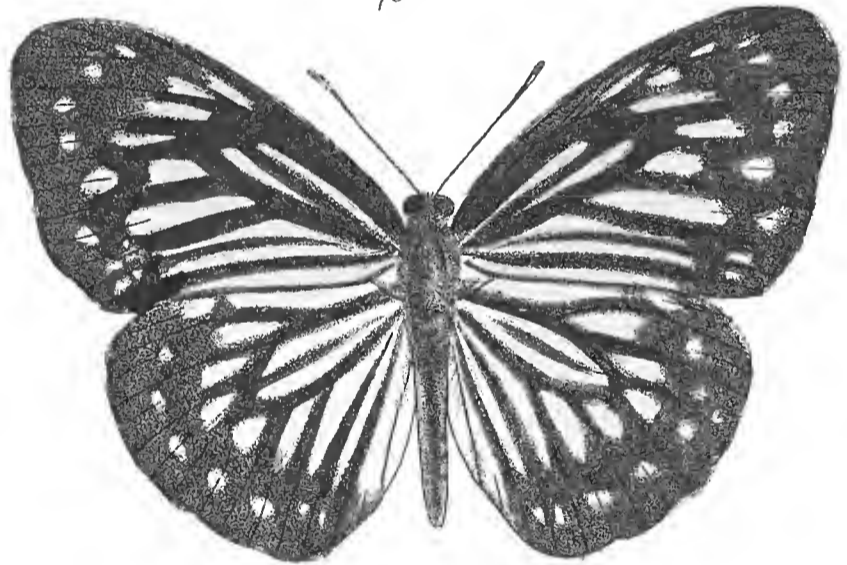
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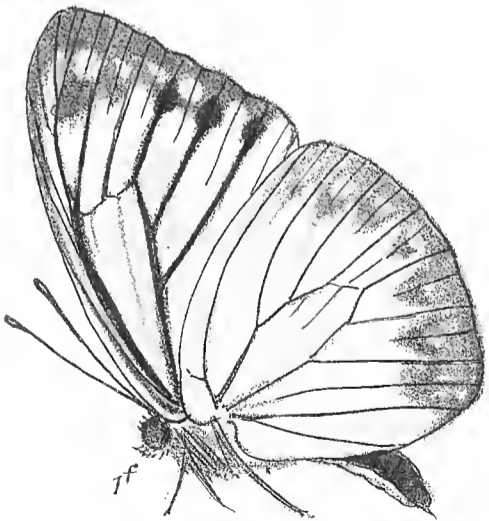
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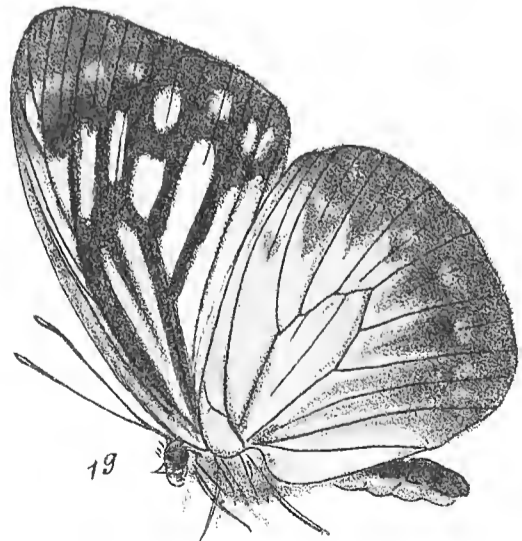
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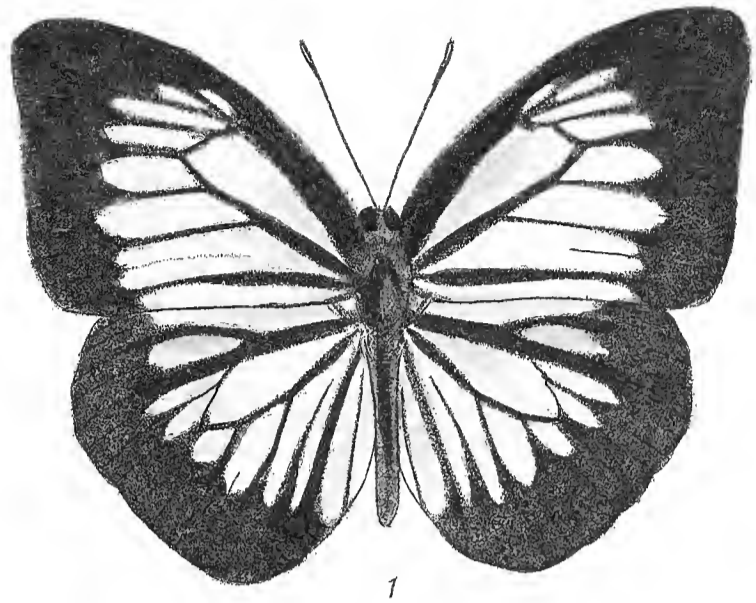


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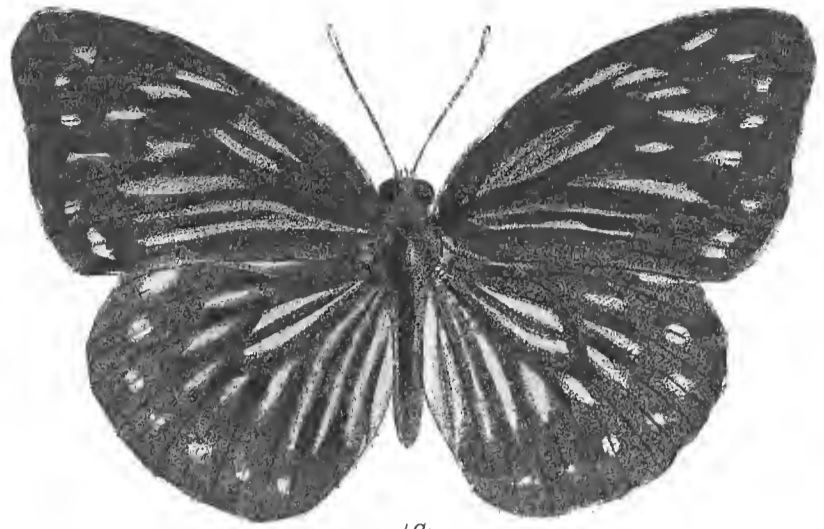
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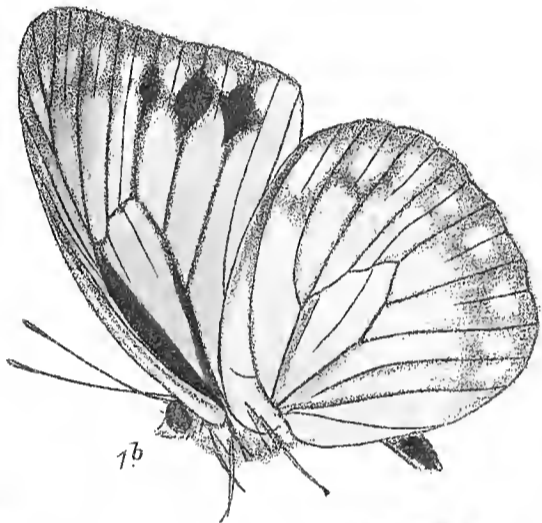
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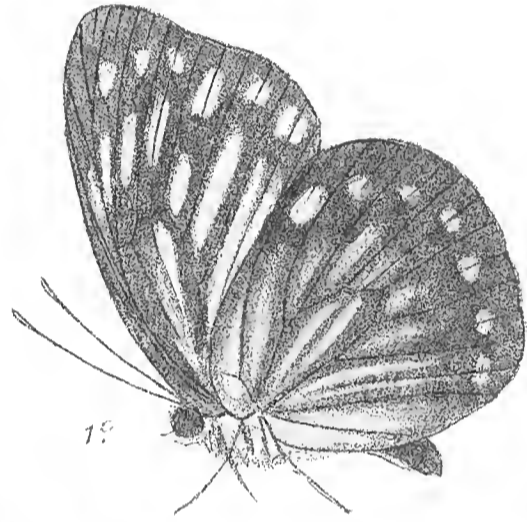
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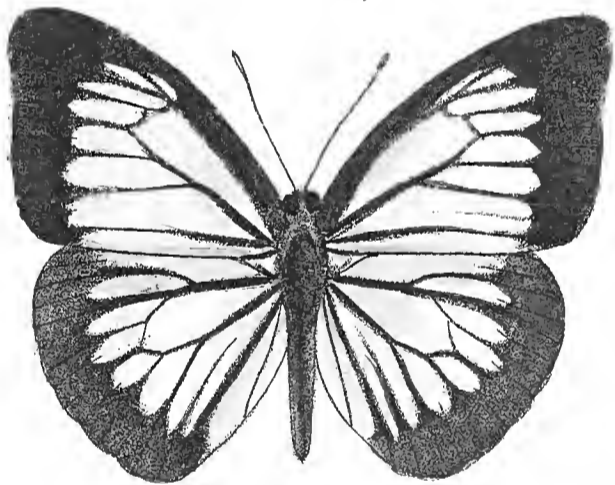
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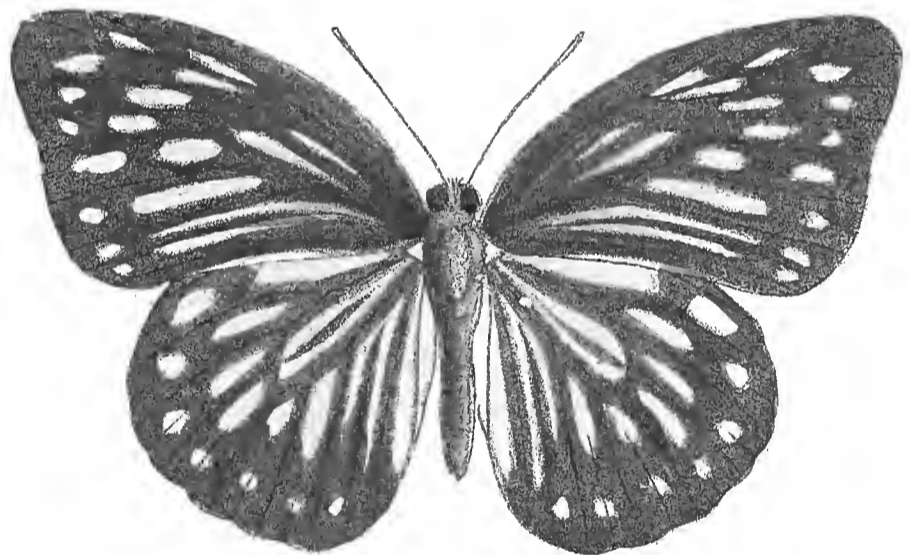
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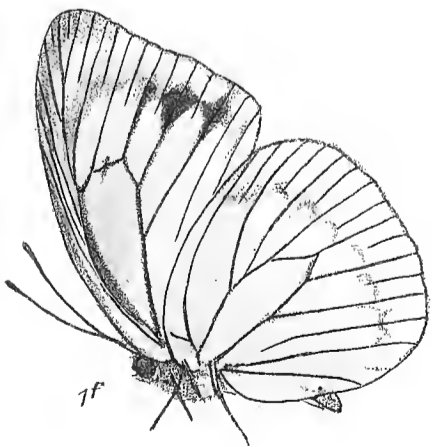
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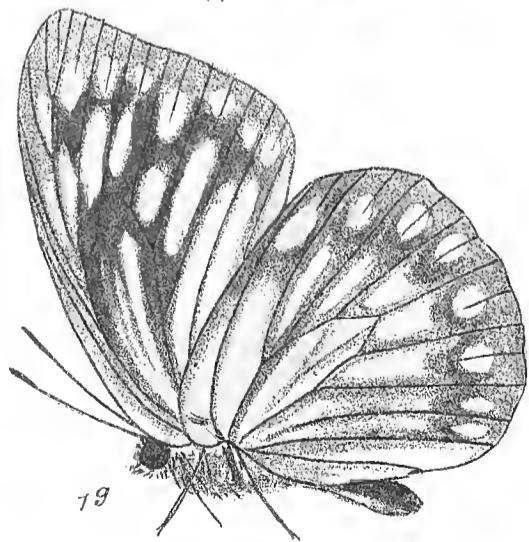
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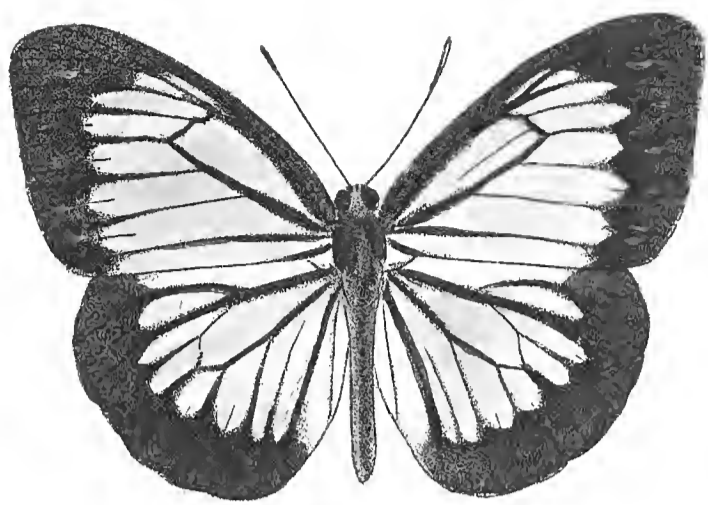
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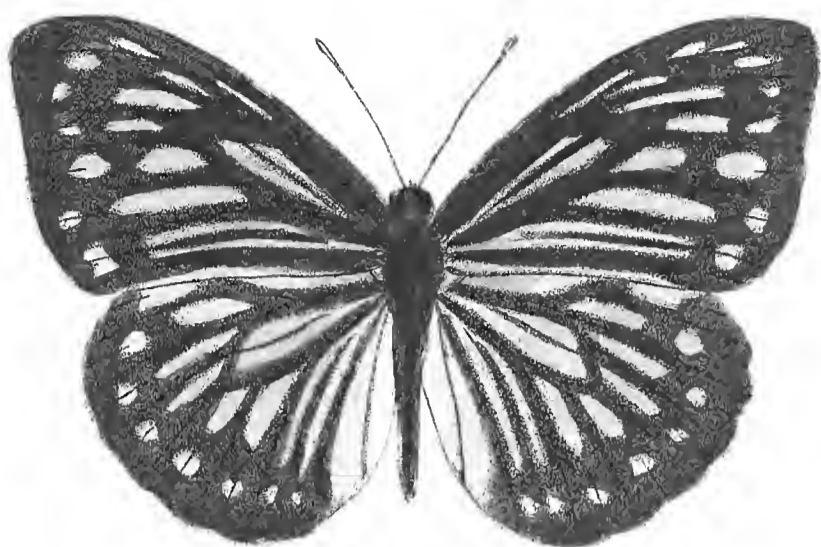
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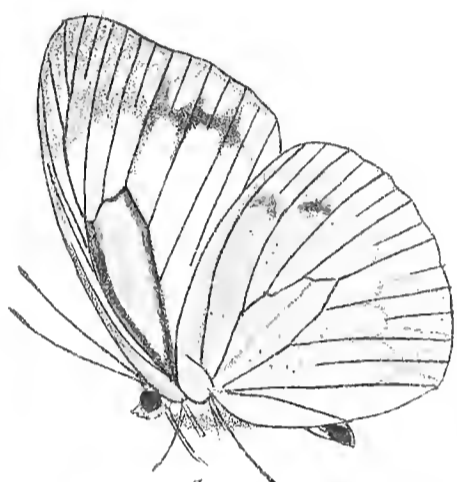




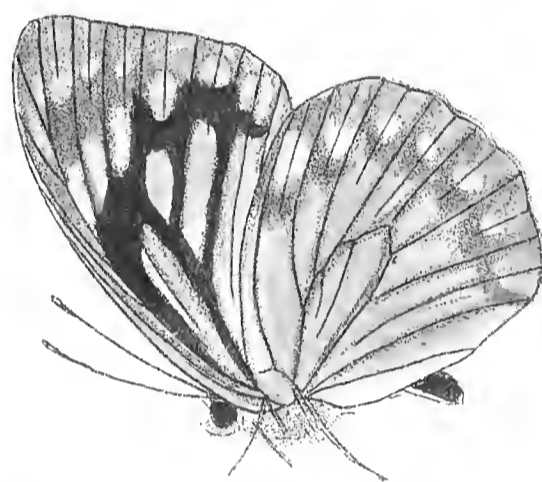
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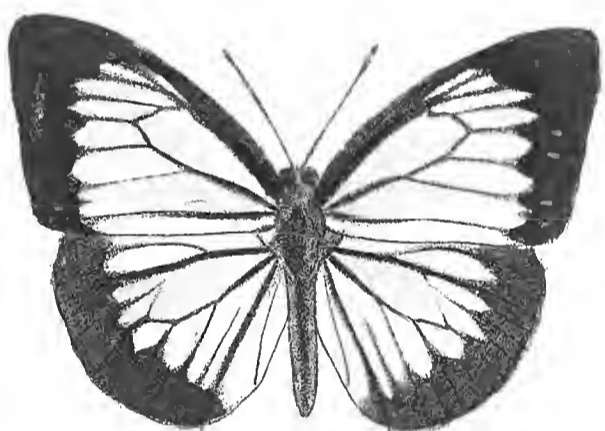
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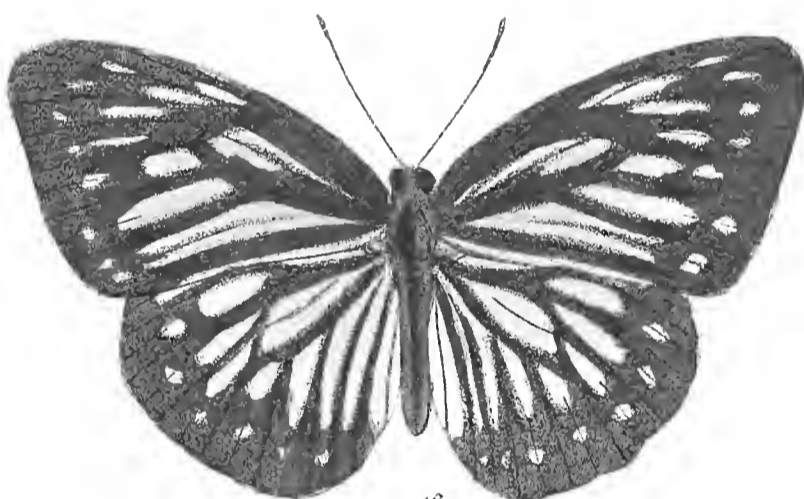
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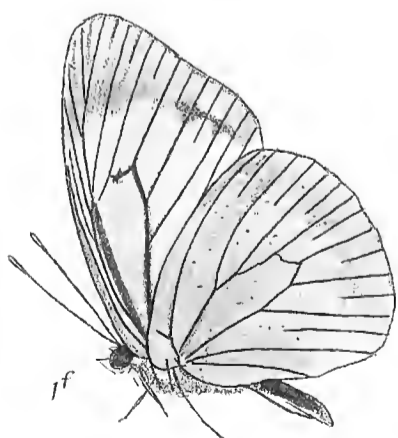
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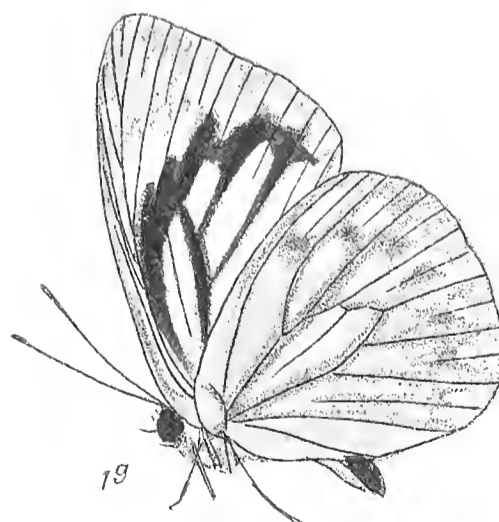
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