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(Part LXXIII.) 73

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LEPIDOPTERA INDICA.

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. Rhop. Exet. ii. P. pl. 2,

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Hindwing unmarked.
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LEPIDOPTERA INDICA.

Sub-family PIERINÆ (continued).

Genus LADE.

Lade, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 153.

Male. *Forewing* triangular, costa much arched towards the end, apex somewhat falcate, exterior margin crenulated anteriorly; cell broad. *Hindwing* triangularly-oval, very convex exteriorly. No tufts of hair present at base of the anal clasps; a lengthened rigid intromittent organ generally exerted.

LADE LALASSIS.

Plate 551, fig. 1, 1a ♂ (*Wet-season Brood*), 1b, c ♂ (*Dry-season Brood*).

Pieris Lalassis, Grose-Smith, Ann. and Mag. Nat. Hist. 1887, p. 265; *id.* Rhop. Exot. ii. P. pl. 2, fig. 1, 2, 3 ♂ (1889).

Hiposcritia Lalassis, Adamson, List Burm. Butt. 1897, p. 44.

Hyposcritia Lalassis, Butler, Ann. Nat. Hist. 1898, p. 395.

Lade Lalassis, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 153.

Pieris Indroides, Honrath, Berl. Ent. Zeit. 1889, p. 403 (*woodcut fig.*).

Hiposcritia Lucasi, var. *Lalassis*, Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 284.

Wet-season form. Male. Upperside greyish-white. *Forewing* with the costa narrowly edged with grey-black scales; a broad black-scaled apical-marginal band decreasing much in width to or near the lower median veinlet, its inner edge being more or less defined, and irregular from below the subcostal; a small more or less ill-defined black-scaled discal spot between the upper and middle median veinlet, and a smaller blacker spot on middle of the lower discocellular veinlet. *Hindwing* unmarked. Underside. *Forewing* with the apical band irrorated with brownish-ochreous scales, the discal and discocellular spot prominently black, the latter larger than on upper-side. *Hindwing* irrorated with brown scales, and traversed by an ill-defined darker-scaled discal and a submarginal zigzag fascia.

Female. Unknown.

Expanse, ♂ 3 to $3\frac{1}{4}$ inches.

Dry-season Form. Male. Upperside. *Forewing* with a much narrower black-scaled apical-marginal band, and a more or less obsolescent discal spot, the latter being sometimes quite obsolete; the discocellular black spot much smaller. Underside similar to *wet-season* form, the apex of *forewing*, and the *hindwing*, being much paler brown scaled.

Female. Unknown.

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

HABITAT.—Lower Burma; Tenasserim; Malay Peninsula.

DISTRIBUTION.—The type specimens described and figured by Mr. H. Grose-Smith were taken by Col. C. H. E. Adamson at Thoungya Sekkan, Upper Tenasserim, who writes “numerous specimens were taken by me on April 24th” (List p. 44). Col. Adamson also obtained specimens in the same locality on February 16th. We have examined the types, and other specimens, both of the *wet* and *dry* form, and we find that all prove to be males, as is evidently the fact by their having the intromittent organ exerted at base of the anal valves. In Mr. Grose-Smith’s collection is a male of the *wet* form, taken by Mr. T. C. Hauxwell in April, in the Dounat Range, Middle Tenasserim; Dr. Leonarda Fea obtained it in the Karen Hills.

The type of *Indroides*, Hagen, is recorded from Perak, Malay Peninsula.

Genus CATOPHAGA.

Catophaga, Hübner, Verz. bek. Schmett. p. 93 (1816). Moore, Lep. of Ceylon i. p. 131 (1881).

Butler, Ann. Nat. Hist. 1898, p. 395.

Tachyris (group A. pt.) Wallace, Trans. Ent. Soc. 1867, p. 363.

Appias (pt.), Distant, Rhop. Malayana, p. 310 (1885).

Appias (sect. *Catophaga*, pt.), Watson, Journ. Bombay Nat. Hist. Soc. 1894, p. 499.

IMAGO.—Male. *Forewing* triangular, apex obtusely pointed; costal vein extending a little over half length of the margin; first subcostal branch emitted at one-third and second at one-fifth before end of the cell, the third bifid, the fourth at one-fourth before the apex, the fifth (or upper radial) at one-fifth beyond the cell; upper and lower discocellular concave, the lower radial from their angle; middle median branch at one-fourth and lower median beyond one-half before end of the cell; submedian vein recurved. *Hindwing* triangularly-oval; exterior margin oblique, very convex anteriorly, anal angle somewhat prolonged; precostal vein short, curved; subcostal somewhat bent at the base of precostal; first subcostal at one-third before end of the cell; discocellulars very oblique, nearly straight; middle median at one-fifth, lower at one-third before end of the cell; submedian vein straight, internal much recurved. *Body* moderate; thorax stout, hairy above; palpi hairy beneath, extending half beyond the eyes, third joint long, slender; legs long,

slender. *Antennæ* with a rather short flattened club. Anal valves with a basal lateral-tuft of hairs beneath; intromittent organ usually exerted.

TYPE.—C. Paulina.

CATOPHAGA WARDII.

Plate 552.

Catophaga Wardii, Moore, Journ. Asiatic Soc. Bengal, 1884, p. 43, ♂ ♀. Hampson, Journ. As. Soc. Beng. 1888, p. 362. Watson, Journ. Bombay Nat. Hist. Soc. 1894, p. 499. Butler, Ann. Nat. Hist. 1898, p. 398. Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 288.
Appias (Catophaga) Wardii, Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1896, p. 574.
Appias Wardii, de Nicéville, Journ. As. Soc. Beng. 1900, p. 256.

Wet-season Brood (Plate 552, fig. 1, 1a ♂, 1b, c ♀).

Male. Upperside greyish-white. *Forewing* with a broad black apical marginal band extending outwardly from middle of the costa to the submedian at the posterior angle, the inner edge of the band is excavated angularly outward beyond the cell beneath the lower subcostal veinlet to the upper median, and is then concave between the middle and lower median, below which the band is imperfect and decreasingly terminates at the submedian; the band is traversed by a curved subapical row of five white spots; basal area of the wing broadly grey and sparsely speckled with minute black scales along base of the costa. *Hindwing* with the outer marginal series of broad more or less confluent dentated black spots decreasing in size and width from the apex, the anal area being slightly speckled with black scales; basal area pale grey scaled. Underside. *Forewing* greyish-white; apex pale yellow, with a black narrow subapical band extending from middle of the costa to posterior angle as on upperside. *Hindwing* uniformly pale yellow throughout.

Female. Upperside greyish-white. *Forewing* with a broader but similar excavated black outer band than in male, the posterior end being entirely black to the submedian vein, the band with three upper subapical white spots, the two lower minute or absent; basal area also darker grey and blackish scaled. *Hindwing* with a broader continuous black outer marginal band, its inner-edge acutely dentated, and inwardly broadly bordered from the lower subcostal veinlet to abdominal margin with greyish-black scales. Underside. *Forewing* with the discal area white, the base pale yellow-tinged, the apex glossy greyish-white, the curved black band broader and more prominent than in the male. *Hindwing* glossy greyish-white, the outer border darkest, the costal edge tinged with pale yellow.

Expanse, ♂ $2\frac{8}{10}$ to 3, ♀ $2\frac{6}{10}$ to $2\frac{8}{10}$ inches.

Dry-season Brood (Plate 552, fig. 1d, e, f, g ♂, h, i ♀).

Male. Upperside of a whiter tint than the *wet* form. *Forewing* with the black

band much less prominent, its apical and lower portions being more or less speckled with white scales, and its inner portion (in *extreme dry* specimens narrower, as in our figure *f*); the subapical white spots less defined, and the upper three more or less elongated; basal area also less grey-scaled. *Hindwing* with the marginal dentate spots much less defined, these being speckled and narrow, showing only at the end of the upper veinlets or are obsolescent, and in *extreme dry* specimens (fig. *f*.) absent. Underside. *Forewing* with the subapical band much less defined, narrower, the basal portion more or less obsolescent, and in *extreme dry* specimens (our fig. 1*g*) obsolete, the apical area and hindwing paler yellow tinted.

Female. Upperside. *Forewing* with the outer band somewhat narrower than in *wet* form, and less intensely black, five subapical white spots being present; the basal grey area also narrower. *Hindwing* with narrower marginal black dentated band. Underside. *Forewing* similar to the *wet* form, except that the black band is much narrower and less black. *Hindwing* very faintly tinged with pale yellow throughout.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{8}{10}$, ♀ $2\frac{6}{10}$ inches.

HABITAT.—South India.

DISTRIBUTION.—This species is confined to South India. The type specimens were obtained by the late Mr. S. N. Ward at Kunur, Nilgiris. Mr. G. F. Hampson records it from the Nilgiris (J. As. Soc. Bengal, 1888, 362). Messrs. Davidson and Aitken obtained "a few specimens, chiefly in the Southern parts of the Kanara District" (J. Bombay N. H. Soc. 1896, 574).

Of our illustrations on Plate 552, fig. 1, 1*a*, *b*, *c*, are from a male and female of the *Wet-season* form, 1*d*, *e*, from a male, and *h*, *i*, from a female of the *Dry* form; fig. 1*f*, *g*, from a male of the *extreme dry* form from S. India, this latter specimen being erroneously figured in Lep. Ceylon i. pl. 50, fig. 3, as the male of *Neombo*.

CATOPHAGA ADAMSONI.

Plate 551, fig. 2, 2*a* ♂, 2*b*, *c* ♀ (*Wet-season Brood*); 2*d*, *e* ♂ (*Extreme Dry Brood*).

Wet-season Brood (Plate 551, fig. 2, 2*a* ♂, 2*b*, *c* ♀).

Male. Upperside similar to the S. Indian *C. Wardii*. *Forewing* comparatively more obtuse at the apex than in the male of that species, the apical band somewhat narrower posteriorly, its anterior inner portion also narrower, and its inner costal portion paler grey-scaled, the four subapical white spots more inwardly positioned; basal area also less broadly grey-scaled. *Hindwing* with the outer marginal row of black, disconnected, well-formed dentate spots.

Underside. Similar to *wet* form of *C. Wardii*, except that, on the forewing, the subapical black band is incomplete and ill-defined.

Female. Upperside somewhat similar to *wet* form of *Wardii*. *Forewing* with the black outer band extending broadly to the extreme posterior margin, the subapical white spots placed less outwardly-oblique. *Hindwing* with a broad black entirely-continuous outer band; costal and basal area slightly flushed with pale yellow. Underside. *Forewing* with the black subapical band somewhat narrower than in *wet Wardii*; basal area and apical edge yellow-tinted. *Hindwing* white, the veins, costa and extreme outer margin slenderly edged with yellow; traversed by a slightly black-scaled submarginal narrow zigzag fascia, the outer margin being slightly glossy greyish-white.

Expanse, ♂ $2\frac{6}{8}$, ♀ $2\frac{6}{8}$ inches.

Dry-season Brood.

Male. Upperside. *Forewing* similar to the above described *wet* form, but with somewhat narrower black outer band (which is also narrower than in the *dry* form of *Wardii*); the subapical spots larger. *Hindwing* with small ill-defined marginal decreasing spots, or short slender streak at end of the upper veins. Underside paler than in *wet* form. *Forewing* with the discal black quadrate spot only present.

Female. Upperside. *Forewing* with duller and comparatively narrower black outer band than in above described *wet* form, the subapical white spots less distinctly formed. *Hindwing* with a duller black marginal continuous band. Underside. *Forewing* with narrower subapical black band than in above *wet* form. *Hindwing* uniformly white.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{6}{10}$, ♀ $2\frac{6}{10}$ inches.

Extreme Dry-season Brood (Plate 551, fig. 2d, e ♂).

Male. Upperside. *Forewing* similar to but with a less prominent black outer band, its inner edge bordering the upper subapical spots being partly obliterated. *Hindwing* with a very few almost invisible minute blackish scales at end of the upper veins. Underside similar to the ordinary *dry* form, the discal black quadrate spot on *forewing* being smaller.

Female. Upperside. *Forewing* very similar to the male. *Hindwing* with a few distinct black scales at end of the upper veins. Underside with the apex of *forewing*, and the entire *hindwing* much paler, almost white. *Forewing* with the discal black spot only present.

Expanse, ♂ ♀ $2\frac{2}{10}$ inches.

HABITAT.—Burma; Upper Tenasserim.

DISTRIBUTION.—Specimens of both sexes of the *wet-season* form, taken in April, in the Thoungying Valley, Upper Tenasserim, by Mr. T. A. Hauxwell are in Mr. H. Grose-Smith's Collection. A male of the *dry-season* form, taken in the Dounat

Range, Upper Tenasserim, by Col. C. T. Bingham, and from Muong Gnow, Shan States, are in Mr. W. Rothschild's Collection. A male of the *dry* form, taken in Rangoon, is in Col. C. Swinhoe's Collection; a female of the *dry* form (above described) was taken in Arrakan in November by Col. C. H. E. Adamson. A male of the *extreme-dry* season form, taken at Hlaingbeoo, Arrakan, in February, is in Col. C. H. E. Adamson's Collection, and a female from Muong Gnow, Shan States, is in Mr. W. Rothschild's Collection.

Of our illustrations on Plate 551, fig. 2, 2a is from the *wet* season male, fig. 2b, c, from the *wet* season female, both taken in April by Mr. Hauxwell; fig. 2d, e, is from the *extreme dry* form taken in February by Col. Adamson.

CATOPHAGA GALATHEA.

Plate 553.

Pieris Galathea, Felder, Verh. Zool. Bot. Ges. xii. p. 485, ♂ (1862); *id.* Reise Novara Lep. ii, p. 165 (1865).

Tachyris Galathea, Wallace, Trans. Ent. Soc. 1867, p. 371.

Appias Galathea, Moore, Proc. Zool. Soc. 1877, p. 591.

Tachyris Paulina, var. *Galathea*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1881, p. 237; *id.* *l.c.* 1882, p. 18.

Catophaga Roepstorffii, Moore, Journ. As. Soc. Bengal, 1884, p. 44, ♂. Watson, Journ. Bombay Nat. Hist. Soc. 1894, p. 499.

Wet season Brood (Plate 553, fig. 1, 1a ♂, 1b, c ♀).

Male. Upperside greyish-white. *Forewing* with the costal base and basal area sparsely dark grey scaled, the costal edge from about its middle and the outer marginal edge to below the middle median veinlet black lined, the apical border with a more or less defined denticulated black-scaled decreasing band (in some specimens wider than in our figure 1), and also a few black scales forming a small patch near the base of lower subcostal veinlet; between the upper and middle median is a more or less defined cluster of black scales. *Hindwing* unmarked. Underside. *Forewing* with the outer discal area greyish-white; the base, costa, and apex tinged with very pale sulphur-yellow; the lower cluster of black scales present as on the upper side. *Hindwing* tinged with very pale ochreous-yellow.

Female. Upperside greyish-white. *Forewing* with the costal base and basal area darker greyish-black scaled, a broad black normal-shaped outer-marginal band extending from middle of costa to posterior angle, and traversed by a series of five white spots, the upper one slender or indistinct, these spots sometimes being very slightly pale yellow-tinted. *Hindwing* with a black outer-marginal continuous dentated band. Underside. *Forewing* with the discal area greyish-white, basal area pale yellow, a

narrow black normal-shaped subapical band paling inward to the middle of the costa, the apical area being deep ochreous-yellow. *Hindwing* uniformly deep ochreous-yellow.

Expanse, ♂ ♀ $2\frac{4}{10}$ to $2\frac{6}{10}$ inches.

Dry-season Brood (Plate 553, fig. 1d, e ♂, 1f, g ♀).

Male. Upperside similar to the *wet* season form, except on the *forewing*, the apical bordering black scales and the lower cluster of scales are obsolescent or absent. Underside similar, the cluster of scales on *forewing* more or less obsolescent.

Female. Upperside. *Forewing* with the outer black band and the subapical white spots as in the *wet* season form, or, the band is slightly broader and the series of spots more medially disposed. *Hindwing* with similar black marginal continuous band, or a variable macular band composed of smaller decreasing spots.

Underside. Both wings greyish-white. *Forewing* with the base sulphur-yellow, the subapical black band somewhat broader and the apical area greyish.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{6}{10}$, ♀ $2\frac{4}{10}$ inches.

HABITAT.—Nicobars; Andamans.

DISTRIBUTION.—The type specimen, in the Berlin Museum, is recorded by Dr. Felder from the island of Sambelong, Nicobars. Messrs. Wood-Mason and de Nicéville record it from Nankowri and Katschall, and Great Nicobar Island (*l.c.* 1882, 18). Prof. R. Meldola obtained it at "Sambelong" (P.Z.S. 1877, 591). A male in the British Museum is labelled "Kamorta." Col. C. Swinhoe has both sexes from Katschall, and a female from Port Blair, Andamans, the latter taken by Mr. Wimberley. Col. C. T. Bingham has recently received it from the Nicobars and the Andamans.

CATOPHAGA PAULINA.

Plate 554.

Papilio Paulina, Cramer, Pap. Exot. ii. pl. 110, fig. E, F ♀ (1779). Herbst, Nat. Schmett. v. p. 82, pl. 91, fig. 1, 2 ♀ (1792); *dry form*. Fabricius, Ent. Syst. iii. p. 189 (1793).

Catophaga Paulina, Hübner, Verz. bek. p. 93 (1816).

Thyca Paulina, Butler, Catal. Fabr. Lep. B.M. p. 205 (1869).

Appias Paulina, de Nicéville, Journ. As. Soc. Bengal, 1899, p. 217.

Catophaga Lankapura, Moore, Proc. Zool. Soc. 1879, p. 142, ♂ ♀; *id.* Lep. of Ceylon i. p. 133, pl. 50, fig. 4, 4a ♂, pl. 51, fig. 1, 1a ♀ (1881); *wet form*.

Catophaga Galene, Moore, Lep. Ceylon i. p. 132, pl. 51, fig. 2, 2a ♂ ♀ (1881); *dry form*.

Wet-season Brood (Plate 554, fig. 1, 1a ♂, 1b, c ♀).

Male. Upperside greyish-white. *Forewing* with a narrow costal and a broad apical ill-defined blackish-scaled marginal band, the latter attenuating posteriorly

and ending beyond the lower median veinlet, its inner edge being sinuated; a few paler scales are contiguously clustered between the upper and middle median. *Hindwing* with a more or less slightly-defined marginal small cluster of blackish scales at end of the veins. Underside. *Forewing* white, the costal border narrowly and the apex broadly pale ochreous-yellow. *Hindwing* uniformly pale ochreous-yellow.

Female. Upperside greyish-white, the hindwing being very faintly tinted with pale yellow. *Forewing* with a broad intense black outer marginal band, traversed by four subapical white spots—the upper one being slender and less distinct; the band curves angularly outward from within upper end of the cell to the middle median veinlet, below which it is deeply excavated to the lower median, and then terminates broadly outward to the posterior angle; base of wing and costal base dark grey scaled. *Hindwing* with a moderately broad black outer marginal sinuous-edged band, the anal area and base of wing being irrorated with dark grey scales. Underside. *Forewing* with a broad black normal-shaped subapical band, its inner-edge as on the upperside; the discal area greyish-white, the base and costal edge pale yellow tinted, the apex bright ochreous-yellow. *Hindwing* bright ochreous-yellow, traversed by a somewhat zigzag blackish-scaled broken submarginal fascia.

Expanse, ♂ ♀ $2\frac{4}{10}$ to $2\frac{8}{10}$ inches.

Dry-season Brood (Plate 554, fig. 1d, e ♂, 1f, g ♀).

Male. Upperside. *Forewing* with a narrower outer-marginal band than in the *wet* form, the cluster of scales between the upper and middle medians absent. *Hindwing* with less apparent marginal tip to the veins. Underside with the apex of *forewing*, and the entire *hindwing* of a much paler yellow.

Female. Upperside similar to the *wet* form. Underside. *Forewing* with similar black band, the apex being pale bluish-grey. *Hindwing* very faintly tinted with glossy pale yellow, and the outer margin with pale glossy bluish-grey, and—in some specimens—portions of the submarginal clusters of scales are very slightly apparent.

Expanse, ♂ $2\frac{4}{10}$, ♀ $2\frac{4}{10}$ to $2\frac{6}{10}$ inches.

HABITAT.—Ceylon.

DISTRIBUTION.—Cramer gives “Coromandel and Java” for his types of *Paulina*; his figures, however, agree only with the dry-season form of our present species, consequently his localities are erroneous. This species is confined to Ceylon. Mr. L. de Nicéville writes that “it is found all over the Island, but is more common at the commencement of the monsoons than at any other times, when it migrates in immense swarms. Strangely enough it has never been bred” (J. As. Soc. Bengal, 1899, 217). Capt. Wade obtained it in the “Western and Central Provinces, both

in the Plains and up to 6,000 feet, in open ground and forest, being much more common in the Hills than in the Plains. It has a very rapid and long flight." Mr. F. M. Mackwood found it "most abundant in low country and up to 4,000 feet. It is found all the year round. In the up-country flights, this species forms a third or half of the whole number; on a sunshiny day thousands will pass by in an hour. When the flight is over, they are to be found congregated on damp spots in the open sunshine in great numbers. I have seen quite 100 within the diameter of twelve inches" (Lep. Ceylon, i. 133). Mr. T. A. Mann (referring to this species as *Galene*) writes: "I observed this butterfly migrating in thousands across the northern part of the Island during March and April, 1859, in a direction from N.E. to S.W. The movement commenced about 7 a.m., and lasted until noon, when it decreased, and was renewed in the afternoon for another two hours" (Proc. Linn. Soc. London, June, 1895).

CATOPHAGA GALENE.

Plate 555.

Pieris Galene, Felder, Reise Novara Lep. ii. p. 165, ♂ (1865).*Tachyris Paulina* (pt.), Wallace, Trans. Ent. Soc. 1867, p. 369.*Catophaga Neombo*, Moore, Lep. of Ceylon, i. p. 131, pl. 50, fig. 3, a, b ♀ (*nec* fig. 3).**Catophaga Venusta*, Moore, Lep. Ceylon, i. p. 132, pl. 51, fig. 3 ♀ (1881). *Dry form*.*Catophaga albina* (pt.), Butler, Ann. Nat. Hist. 1898, p. 397.*Appias albina*, de Nicéville, Journ. As. Soc. Bengal, 1899, p. 217, *nec* Boisd.†

Plate 555, fig. 1, 1a, b ♂, 1c, d, h, i ♀.

Male. Upperside greyish-white. *Forewing* with the base of costal border and basal area very slightly grey-scaled, the apical border very slenderly sinuously-edged with dusky-grey scales, or these scales are absent (as in fig. 1b). *Hindwing* unmarked, or the upper veinlets marginally ended with a few dusky grey scales. Underside. *Forewing* with the apical area, and the entire hindwing, washed with very pale ochreous-yellow.

Female. *Trimorphic*. Form I. (*wet season*, fig. 1c, d, h, i.) Upperside with the ground-colour of both wings yellow, that of the forewing being of a more or less pale lemon-yellow tint, and the hindwing of an ochraceous tint. *Forewing* with the basal area and base of costa broadly dusky-grey scaled; a broad black outer band extending from middle of the costa and decreasing hindward to the posterior angle, its inner upper edge being outwardly-oblique and angled beyond the upper end of the cell and again at upper median veinlet, below which it is excavated to the

* This fig. 3 was taken from a South Indian specimen in our Collection, which we then mistook to be the male of this species, but have now proved it to be the *extreme-dry* form of *C. Wardii*, and as such we have described it and refigured it on our Plate 552 (fig. 1f, g).

† The true *albina* of Boisduval (Spéc. Gen. p. 480) is an allied species from Amboina.

lower median, and thence decreases outwardly to the posterior angle; the band is traversed by four yellow subapical spots and sometimes an upper fifth speckled spot is also apparent, the entire series vary in size, the larger series (fig. h) being more inwardly positioned. *Hindwing* with a black outer marginal dentated continuous or macular band, and in some specimens with the continuous band there are submarginal clusters of minute black scales. Underside. *Forewing* with the discal area pale lemon-yellow as on upperside, the basal and apical area deep ochreous-yellow; the subapical normal-shaped black band narrow, either prominent or ill-defined. *Hindwing* uniformly deep ochreous-yellow.

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

Form II. (Plate 555, fig. 1e, f, g), *dry-season*. Upperside. Both wings with the ground-colour greyish-white, the hindwing with very faint traces of pale yellow along extreme outer margin. *Forewing* with the black outer band similar, the subapical spots being white and comparatively more medially positioned. *Hindwing* with the black marginal band more macular and in some specimens decreasingly smaller. Underside white, the hindwing being very faintly glossy yellowish-tinged and with a pale greyish outer marginal border. *Forewing* with the base faintly pale yellow tinged, the apex pale grey, the black subapical band more curved on its outer edge.

Expanse, $2\frac{2}{10}$ inches.

Form III. (Plate 555, fig. 1j, k ♀), *extreme dry season*. Upperside. Both wings with the ground-colour greyish-white, their black markings, and apical white spots on the forewing, disposed as in the yellow form, fig. 1h. Underside greyish-white, the *hindwing* glossy and very faintly tinged with pale yellow, and the outer border pale grey tinged. *Forewing* with the black band slender and ill-defined, the apex glossy pale grey and outwardly edged with pale yellow.

Expanse, $2\frac{2}{10}$ to $2\frac{4}{10}$ inches.

HABITAT.—Ceylon.

DISTRIBUTION.—Capt. Hutchison records it as being found in the Hills of the Central Provinces, from 3,000 to 6,000 feet elevation, in open places in forest, generally in company with the preceding species, the yellow variety being found with the white one, but less common. Mr. F. M. Mackwood obtained it "in the Hills from 2,500 and principally up to 4,000 feet. It is found in abundance in the early months of the year, taking part in the large annual flights of butterflies" (Lep. Ceylon, i. 131). Mr. L. de Nicéville writes, "It is particularly common in Ceylon, occurring wherever *Paulina* is found and at the same seasons" (J. A. S. Beng. 1899, 217).

Of our illustrations on Plate 555, fig. 1, 1a is from a *wet* season male; 1b, the male type of Felder's *Galene*—now in Mr. Walter Rothschild's Collection; fig. 1c, d, and h, i, *yellow* females of the *wet* form; fig. 1e, f, g, *white* females—*dry* season form, and fig. 1j, k, *extreme dry* female.

CATOPHAGA SWINHOEI.

Plate 556, fig. 1, *larvæ* and *pupæ*, 1a, b, c ♂ ; 1d, e, f, g, h, i, j ♀.

Appias Ares (pt.), Swinhoe, Proc. Zool. Soc. 1885, p. 138 ♂ ; Moore, Lep. Indica, vi. p. 205, pl. 542, fig. 3 ♂ (1905).

Catophaga Paulina, Taylor, Butt. of Orissa, p. 15 (1888).

Catophaga Neombo, Hampson, Journ. As. Soc. Bengal, 1888, p. 362.

Catophaga Lankapura, Watson, Journ. As. Soc. Bengal, 1890, p. 268.

Appias Neombo, Davidson and Aitken, Journ. Bombay N. H. Soc. 1896, p. 574 ; de Nicéville, Journ. As. Soc. Bengal, 1900, p. 254.

Both sexes smaller than *C. Darada*. Male (fig. 1a, b, c). Upperside. *Forewing* greyish-white, apical marginal band narrower and less defined. *Hindwing* unmarked. Underside with the apex of *forewing*, and the entire *hindwing* very faintly tinted with pale yellow.

Female. Dimorphic. *Form I.* (fig. 1d, e, f). Upperside greyish-white. *Forewing* with the black outer band somewhat narrower than in *Darada*, the subapical white spots similarly disposed. *Hindwing* with the marginal black dentated band also comparatively narrower and continuous, or sometimes macular. Underside. *Forewing* with greyish-white discal area, the basal area, costal and outer marginal edge pale yellow, the normal-shaped black subapical band narrow, and the apical area glossy pale grey. *Hindwing* glossy greyish-white, the basal and costal area and the outer edge slightly tinted with pale yellow.

Expanse, ♂ $2\frac{3}{10}$ to $2\frac{4}{10}$, ♀ $2\frac{3}{10}$ to $2\frac{6}{10}$ inches.

Form II. (fig. 1g, h). Smaller than in *form I.* Upperside. *Forewing* with the outer band narrower, the subapical white spots less medially positioned. *Hindwing* with the marginal band composed of smaller dentate spots. Underside similar to *form I.*

Expanse, $2\frac{2}{10}$ inches.

Form III. (fig. 1i, j). Upperside similar to *form II.* Underside. *Forewing* with the apical area, and the entire *hindwing* ochreous-yellow.

Expanse, $2\frac{4}{10}$ inches.

LARVA.—Slender ; dorsally and sublaterally clothed with fine short hairs ; head slightly hairy ; a pale green dorsal, a pale yellow lateral, and a brown sublateral stripe extending from head to anal segment ; head and legs brown.

PUPA.—Head with a frontal point ; thorax dorsally produced and angled ; basal segments of abdomen broad and laterally angled. Colour pale green ; wing cases and a lateral oblique abdominal stripe pale yellow. (Described from Sir W. Elliot's drawing).

HABITAT.—Southern India.

DISTRIBUTION.—Col. C. Swinhoe has males from Ahmedabad, and Bisnuggur in

Guzerat, taken in December, and from Poona, taken in November, January, and February, also male from N. Kanara, taken by Mr. Davidson, and a male from Orissa (*ex* Coll. de Nicéville). We possess a male from Poona taken in January by Col. Swinhoe, both sexes from N. Kanara, taken by the late Mr. S. N. Ward, also both sexes from the Nilgiris (*ex*. Coll. Hampson), and from Travancore. Capt. E. Y. Watson records it (as *Lankapura*) from "Madras, taken in July and August" (*l.c.* p. 268). The larva of this butterfly was found by the late Sir W. Elliot at Elamane, Madras, on November 25th, changing to pupa December 8th, and the imago emerging December 17th, a coloured drawing being made of both larvæ, pupæ, and imago, the latter agreeing exactly with our male (fig. 1a, b).

Of our illustrations on Plate 556, fig. 1, *larvæ* and *pupæ*, are copied from and in the same positions as in Sir W. Elliot's original drawing; fig. 1a, b, from a male taken at Poona in February, by Col. Swinhoe; fig. 1c, from a S. Indian male; 1d, e, from a Malabar female; 1f, from a S. Indian female; 1g, h, from a Travancore female; and 1i, j, from a female taken above the west Ghâts by Mr. S. N. Ward.

CATOPHAGA DARADA.

Plate 557.

Pieris Darada, Felder, Reise Novara Lep. ii. p. 166, ♂ (1865).

Catophaga Darada, de Nicéville, Journ. As. Soc. Beng. 1885, p. 50. Swinhoe, Trans. Ent. Soc. 1893, p. 310.

Tachyris Paulina (var.), Wallace, Trans. Ent. Soc. 1867, p. 370.

Catophaga Paulina et *Neombo*, Moore, P. Z. S. 1878, p. 838.

Tachyris Paulina, Elwes, Trans. Ent. Soc. 1888, p. 418.

Catophaga Paulina, Rothney, Ent. Mo. Mag. 1882, p. 35. de Nicéville, Journ. As. Soc. Bengal, 1886, p. 371; *id.* Sikkim Gazetteer, 1894, p. 169. Watson, Journ. Bombay N. H. Soc. 1891, p. 53.

Appias Paulina, Adamson, List Burmese Butt. p. 44 (1897). Watson, Journ. Bombay N. H. Soc. 1897, p. 670.

Wet-season form (Plate 557, fig. 1, 1a ♂, 1b, c ♀).

Male. Upperside greyish-white. *Forewing* with the costal border blackish-grey speckled; an outer marginal black-scaled band decreasing hindward to beneath the lower median veinlet, its inner-edge being distinctly sinuous; basal area tinged with pale grey. *Hindwing* with an outer marginal series of five black-scaled small dentated spots. Underside. *Forewing* greyish-white, the basal area faintly tinged with pale yellow, the apex very pale ochreous-yellow. *Hindwing* uniformly very pale ochreous-yellow.

Female. Upperside greyish-white; the hindwing extremely faintly tinged with pale yellow. *Forewing* with the basal area and costal base broadly blackish-grey scaled; a broad black outer marginal band extending from before middle of the costa to posterior margin, the band being angled outward beyond lower end of cell and

excavated between the middle and lower median, and traversed by a subapical series of decreasing white spots, usually four, and sometimes an upper fifth is slenderly apparent. *Hindwing* with the basal area dusky-grey scaled; a moderately broad black outer-marginal dentated band, which, in some specimens, has a few blackish scales scattered between the posterior portions. Underside. *Forewing* basally tinged with pale yellow, the apex clear ochreous-yellow, the normal-shaped black subapical transverse band narrow. *Hindwing* uniformly clear ochreous-yellow.

Expanse, ♂ $2\frac{4}{10}$ to 3, ♀ $2\frac{6}{10}$ to $2\frac{8}{10}$ inches.

Dry-season form (Plate 557, fig. 1d ♂, e, f ♀).

Male. Upperside. *Forewing* with the outer band comparatively narrower than in *wet* form. *Hindwing* with the marginal spots small and slender. Underside similar, the apex of forewing, and the hindwing paler.

Female. Upperside similar to *wet* female, both wings being uniformly greyish-white. Underside. *Forewing* with the black subapical band slightly broader, the apex being glossy pale grey. *Hindwing* glossy pale grey.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{8}{10}$, ♀ $2\frac{6}{10}$ to $2\frac{8}{10}$ inches.

Extreme dry form (Plate 557, fig. 1g ♂, h, i ♀).

Male. Upperside. *Forewing* comparatively more pointed at the apex, the apical margin with narrower and less-defined, or obsolescent, blackish-scaled border. *Hindwing* unmarked. Underside similar to the ordinary *dry* form, the apex, and the hindwing being somewhat brighter pale yellow tinted.

Female. Upperside greyish-white. *Forewing* with the black outer band somewhat narrower than in the ordinary *dry* form, the white subapical spots less medially disposed. *Hindwing* with the black marginal band macular and narrower.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{6}{10}$, ♀ $2\frac{4}{10}$ inches.

HABITAT.—Lower Sikkim; Assam, Khasias, Silhet; Lower Bengal; Burma; Upper Tenasserim.

DISTRIBUTION.—We possess both sexes of the *wet-season* form from Darjiling and from Eastern Bengal; also female from Barrackpur, near Calcutta, taken by Mr. J. Rothney; males of the *wet* form from Lushai and Moulmein, Burma. Of the *dry-season* form, we have males from Silhet, and Parisnath Hill, Lower Bengal, taken in September by the late W. S. Atkinson, and from Upper Tenasserim, also females from Darjiling and Barrackpur; of the *extreme dry* form we have males from Moulmein. Col. C. Swinhoe has the male of the *wet* form from Palene, Burma, a female of the *dry* form from the Khasias, and Palene, and also *extreme dry* from Palene. In Mr. Walter Rothschild's Collection is a *wet* male from Dibrugarh, Assam. Mr. H. Grose-Smith has a female of the *dry* form from Malda, Bengal, and *extreme dry*

from Burma (*ex* Coll. Hauxwell). Mr. H. J. Elewes writes, "Möller notes it as rare in Sikkim, in April and May, at the lowest elevations" (Tr. Ent. Soc. 1888, 418). The type specimen is recorded by Dr. Felder, from Silhet. Col. C. Swinhoe has received specimens from the "Khasia Hills" (*l.c.* 1893, 310). Mr. J. Wood-Mason obtained "seven males in forests in and around Silcuri, Cachar, from May 20th to July 11th, a male on Nemotha Peak, 3,634 feet elevation, October 2nd; also twelve females from May 20th to July 11th, and three females with the apex of forewing and entire hindwing on underside rich ochreous, in June and July, around Silcuri" (J. As. Soc. Beng. 1887, 371). Mr. J. Rothney caught it in "Barrackpur Park, near Calcutta" (Ent. Mo. Mag. 1882, 35). Mr. L. de Nicéville took "a single male in the neighbourhood of Calcutta, in August" (J. As. Soc. Beng. 1885, 50). Capt. E. Y. Watson records "a single female taken at Loungat, in May, during the Chin-Lushai Expedition of 1889-90" (J. Bombay N. H. Soc. 1891, 53), also "a single specimen in the Upper Chindwin District in May, and numerous specimens in the Hills, from 3,500 feet, during the rains" (*l.c.* 1897, 670). Col. C. H. E. Adamson obtained "numerous males, and one female, in November, in the Arakan Hills and in Tenasserim" (List Burm. Butt. 44). Dr. N. Manders probably refers to this species [as *T. Paulina*] being "rare at Fort Stedman, Shan States, but common in the Mone Valley, in April" (Tr. Ent. Soc. 1890, 534).

Of our illustrations on Plate 557, fig. 1, 1a, are from a *wet-season* male from Lushai, and 1b, c, a female from Darjiling; fig. 1d, from Felder's male *type*, in Mr. W. Rothschild's Collection; 1e, f, a *dry-season* female from Barrackpur; fig. 1g, a male of *extra-wet* form from Moulmein, and h, i, a female from Palene, Burma.

INDO-MALAY SPECIES.—*Catophaga Leis*, Hübner, Zutr. Exot. Schmett, fig. 771-2 ♀ (1832). *Syn.* *Pieris Amasene*, Boisd. Spec. Gén. Lep. p. 335, ♂ (1836). *Pieris Alope*, Wallace, Trans. Ent. Soc. 1867, p. 372, ♂. *Habitat.* Java.

Catophaga Distanti (Appias Leis, Distant, Rhop. Malay. p. 313, pl. 25, fig. 7 ♂, 6, 10 ♀ (1885). *Catophaga Leis*, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 502. *Habitat.* Malay Peninsula; Sumatra; Borneo.

Catophaga Agave (*Pieris Agave*, Felder, Wien. Ent. Monats. 1862, p. 286. Appias Agave, Semper, Stett. Ent. Zeit. 1875, p. 398; *id.* Reise Phil. Lep. ii. p. 247, pl. 40, fig. 9-11, ♂ ♀ (1891). *Habitat.* Philippines.

Catophaga Maria (Appias Maria, Semper, Stett. Ent. Zeit. 1875, p. 405, ♂ ♀; *id.* Reise Phil. Lep. ii. p. 247, pl. 39, fig. 1-4, ♂ ♀ (1891). Butler, Ann. Nat. Hist. 1898, p. 398. *Habitat.* Luzon, Philippines.

Catophaga Mata (*Tachyris Mata*, Kheil, Lep. Ins. Nias, p. 34, pl. 4, fig. 21, ♂ (1884). *Habitat.* Nias.

Catophaga Semperi (*Appias albina*, Semper, Stett. Ent. Zeit. 1875, p. 36, ♂; *id.* Reise Phil. p. 246, pl. 40, fig. 6, 7, 8, ♂ ♀ (1891). *Habitat.* Philippines.

Catophaga Neombo (Pieris Neombo, Boisd. Spec. Gén. Lep. i. p. 539, ♀, *white form* (1836). Moore, Catal. Lep. Mus. E. I. Company, i. p. 72, pl. 2a, fig. 3, ♀, *yellow form* (1857). Type in Coll. C. Oberthür. Compared June, 1905. Agrees precisely with *white* females from Sumatra and Borneo in our possession. A *yellow* female from Borneo is in the Hewitson cabinet. *Habitat.* Sumatra; Borneo; Java.

Genus SALETARA.

Saletara, Distant, Rhop. Malayana, pp. 287, 316 (1885). Semper, Reis. Phil. Lep. p. 249 (1891).

Butler, Ann. Nat. Hist. 1898, p. 400.

Tachyris (group A, pt.) Wallace, Tr. Ent. Soc. 1867, pp. 312, 363.

Appias (sect. *Catophaga*, pt.) Watson, Journ. Bombay N. H. Soc. 1894, p. 499.

Catophaga (group 3, *Saletara*), Butler, Ann. Nat. Hist. 1898, p. 399.

Trigonia (pt.), Geyer, Hübner's Zutr. v. pp. 21, 35 (1837); *preoccupied*.

Male. *Forewing* triangular, costa long and almost straight, apex acutely pointed, exterior margin very oblique; third subcostal veinlet, normally, with a short furcation (or fourth branch) at its apex, the latter being sometimes present on one wing only, or, occasionally, absent. *Hindwing* triangularly oval. Anal tufts long, the valves also hairy above; intromittent organ sometimes exerted.

TYPE.—S. *Distanti* [Nathalia].

SALETARA CHRYSÆA.

Plate 558, fig. 1, 1a ♂, 1b, c ♀.

Saletara Panda, subsp. *Chrysa*, Fruhstorfer, Soc. Ent. 1903, p. 124; *id.* Stett. Ent. Zeit, 1904, p. 348.

Male. Upperside. *Forewing* white, the lower discal area very faintly tinted with pale ochreous-yellow, becoming slightly darker along the posterior angle; base of costal border and discal area greyish-black scaled, the apical costal-edge being black; outer margin with a narrow sinuated black band, which is attenuated posteriorly and ends beyond the lower median veinlet. *Hindwing* entirely ochreous-yellow, without any marginal markings. Underside. Both wings ochreous-yellow.

Female. Upperside ochreous-yellow. *Forewing* with the base broadly greyish-black scaled, the costal border from about the middle and the outer border broadly black. *Hindwing* with a broad black outer marginal sinuated band, the upper portion being macular; basal area and lower discal area slightly greyish-black scaled, the abdominal margin being white. Underside. *Forewing* pale yellow, the posterior border being white; a black band curving outward from the third subcostal to the posterior angle; the apical border, and outer margin narrowly, being pale yellow, and enclosing a series of subapical white spots. *Hindwing* white; the costal and outer border being very narrowly edged with pale yellow.

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

HABITAT.—Nicobar Islands.

Described from specimens in Col. C. T. Bingham's Collection, taken on Great Nicobar Island, March, 1904, by Mr. G. Rogers.

INDO-MALAYAN SPECIES.—*Saletara Distanti*, Butler, Ann. Nat. Hist. 1898, p. 400, ♂ ♀. Sal. Nathalia, Distant, Rhop. Malay. p. 317, pl. 26, fig. 1, 2, ♂ ♀ (1885). Snellen, Mid. Sumatra, p. 8, pl. 2, fig. 6-11 (1888). de Nicéville, Journ. As. Soc. Beng. 1895, p. 504. *Tachyris Nathalia*, Wallace, Tr. Ent. Soc. 1867, p. 369. *Habitat.* Malay Peninsula; Singapore; Sumatra; Borneo.

Saletara Engania, Fruhstorfer, Soc. Ent. 1903, p. 124; *id.* Berl. Ent. Zeit. 1904, p. 203; *id.* Stett. Ent. Zeit. 1904, p. 347. P. Panda, *var.* Snellen, Tijd. v. Ent. 1895, pl. 1, fig. 3, ♂. *Habitat.* Engano Island; Nias Island.

Saletara Panda (*Pieris Panda*, Godart, Encyc. Méth. ix. p. 147, ♂ (1819). Boisd. Spec. Gén. Lep. p. 485 (1836); Moore, Catal. Lep. Mus. E. I. Company, i. p. 71 (1857). *Trigonia Panda*, Geyer, Hübner's Zutr. v. p. 35, fig. 943-4, ♂ (1837). *Tachyris Panda*, Wallace, Tr. Ent. Soc. 1867, p. 368. *Saletara Panda*, Butler, Ann. N. H. 1898, p. 400. *Syn.* *Pieris sulphurea*, Vollenhoven, Monog. Pier. p. 32, pl. 4. fig. 4, ♀ (1865). *Habitat.* Java.

Saletara Nathalia (*Pieris Nathalia*, Felder, Wien. Ent. Monat. 1862, p. 285), Semper, Reis. Phil. Lep. p. 249, pl. 40, fig. 12, 13, ♀ (1891). Butler, Ann. Nat. Hist. 1898, p. 400. *Syn.* *Tachyris Panthea*, Wallace, Tr. Ent. Soc. 1867, p. 376, ♀. *Habitat.* Philippines.

Genus TACHYRIS.

Tachyris (sect. C, pt.), Wallace, Trans. Ent. Soc. 1867, pp. 312, 316.

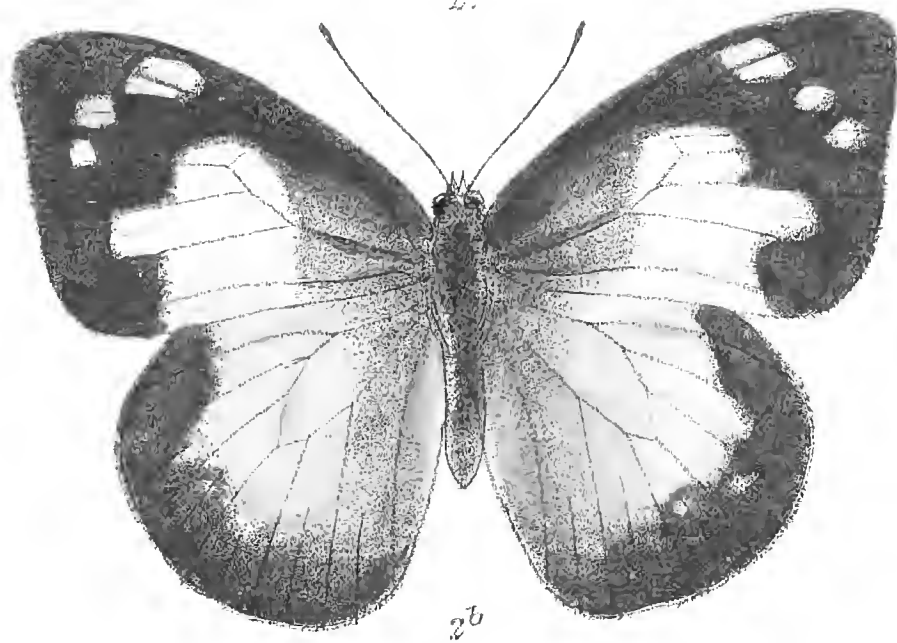
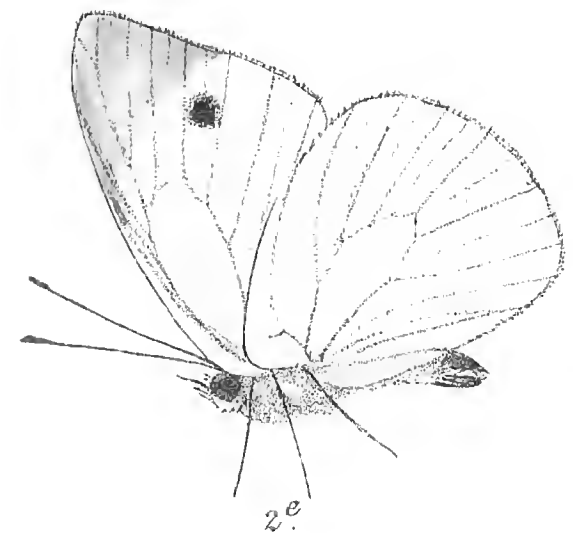
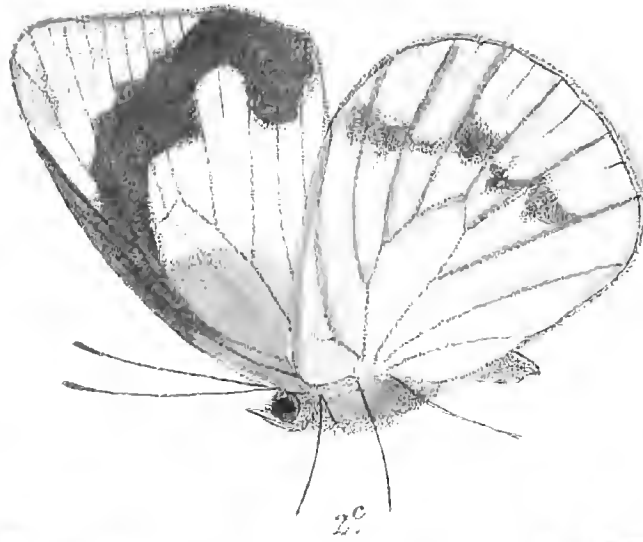
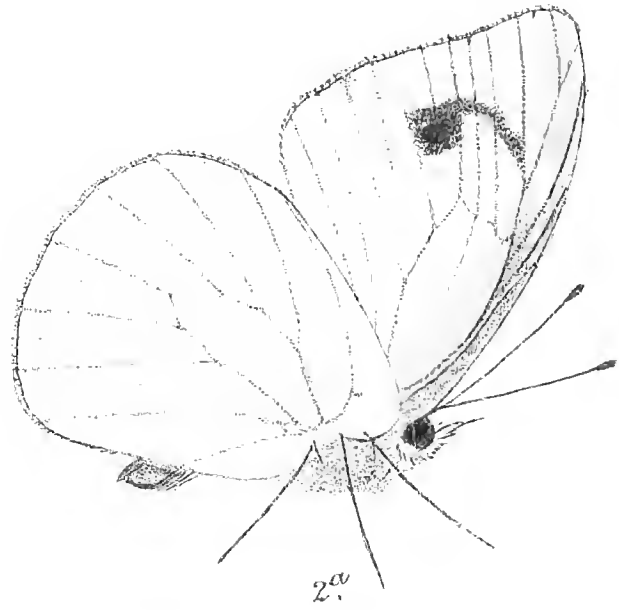
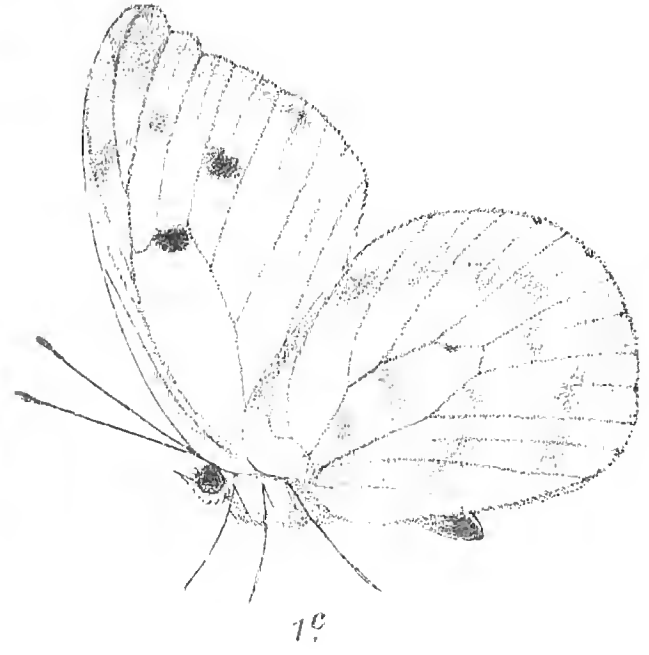
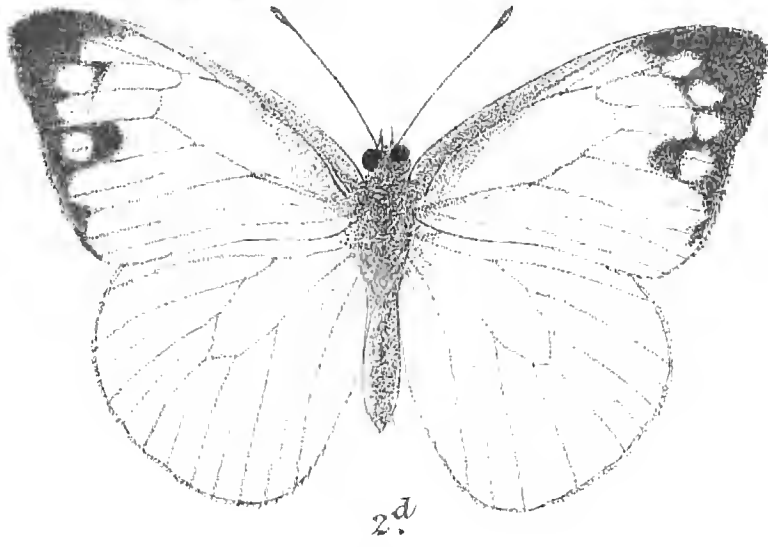
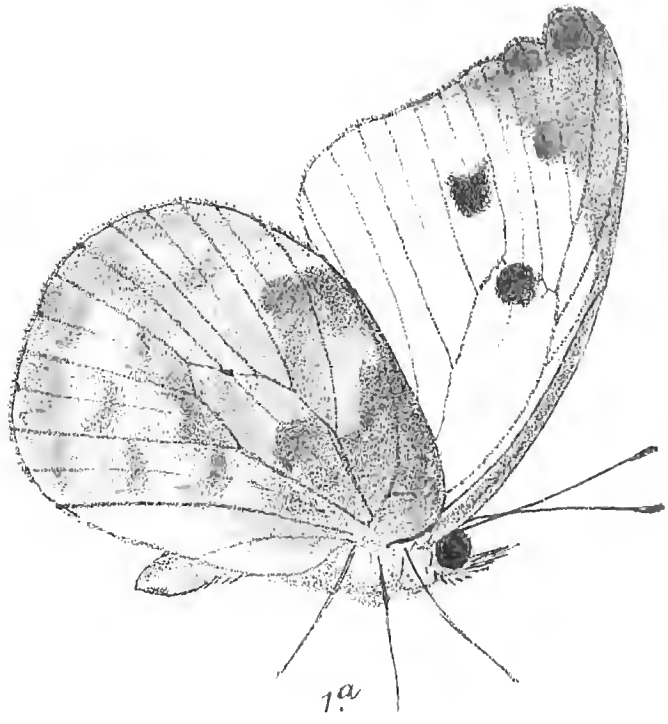
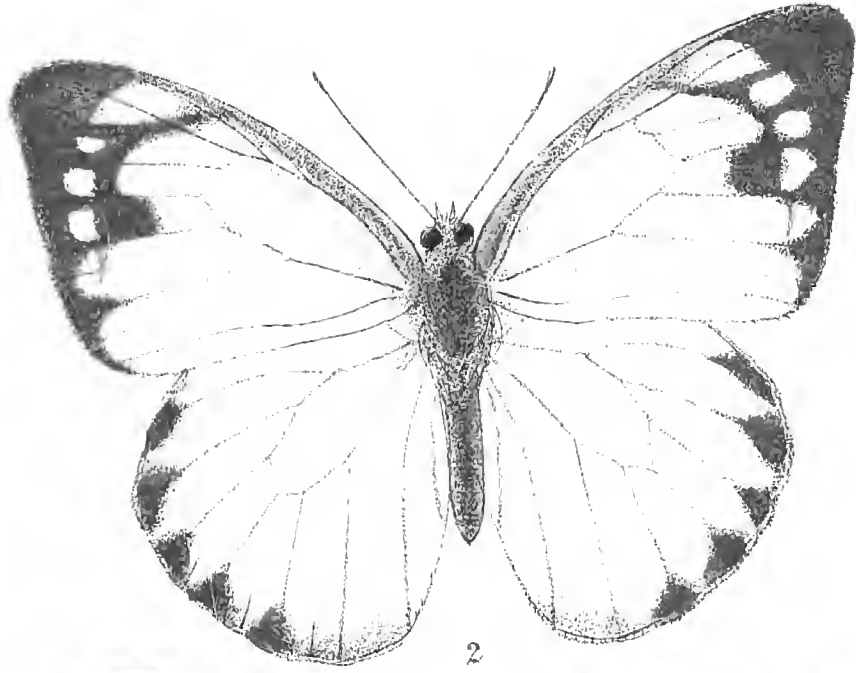
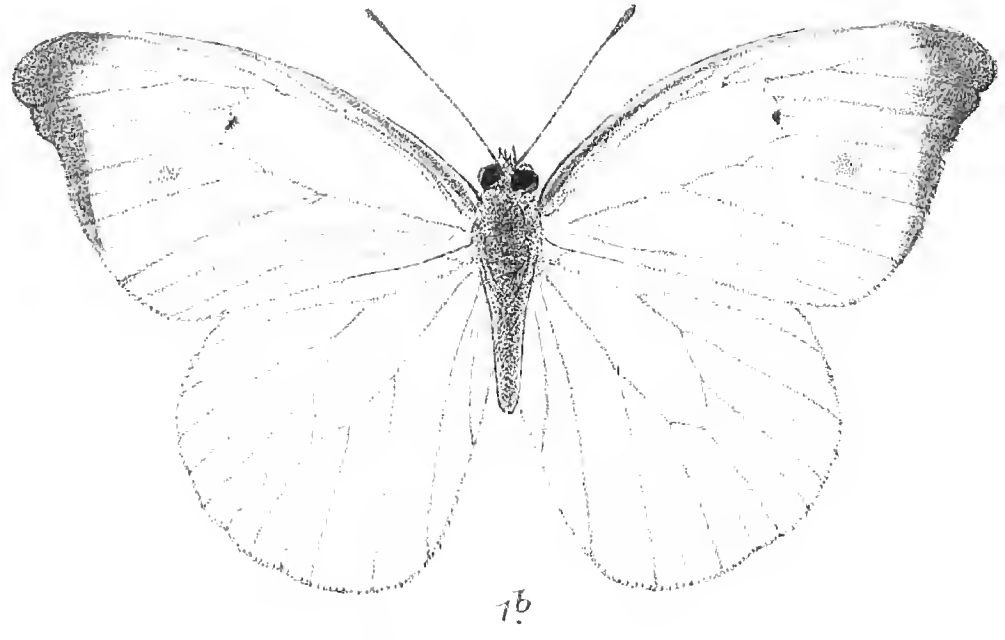
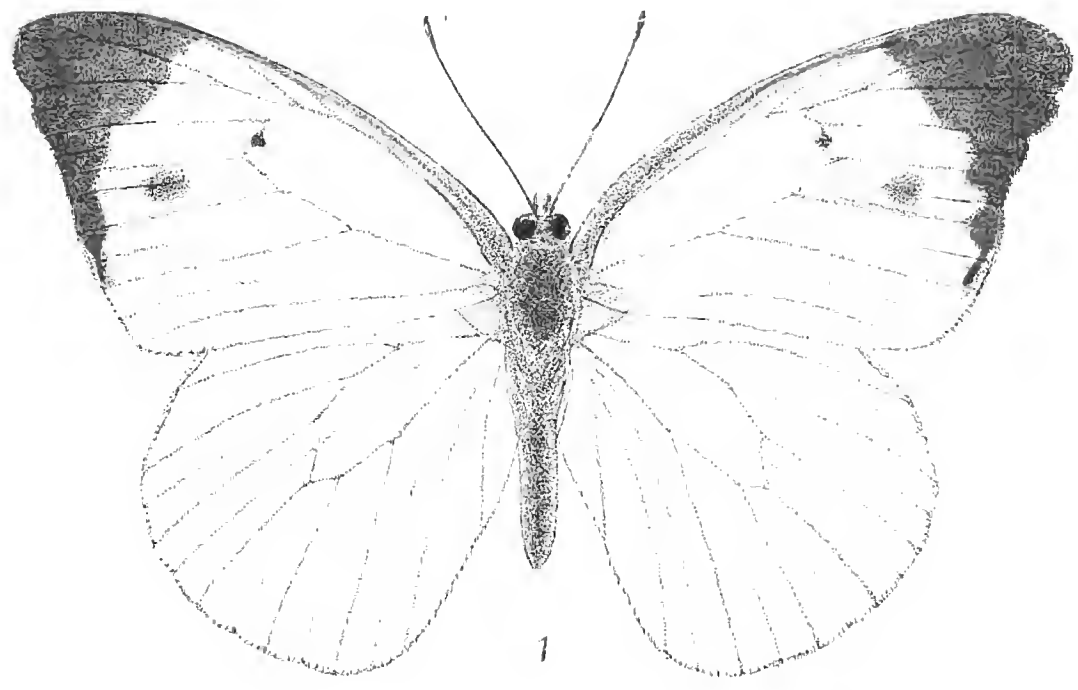
Tachyris, Scudder, Proc. Amer. Acad. A. Sc. 1875, p. 274.

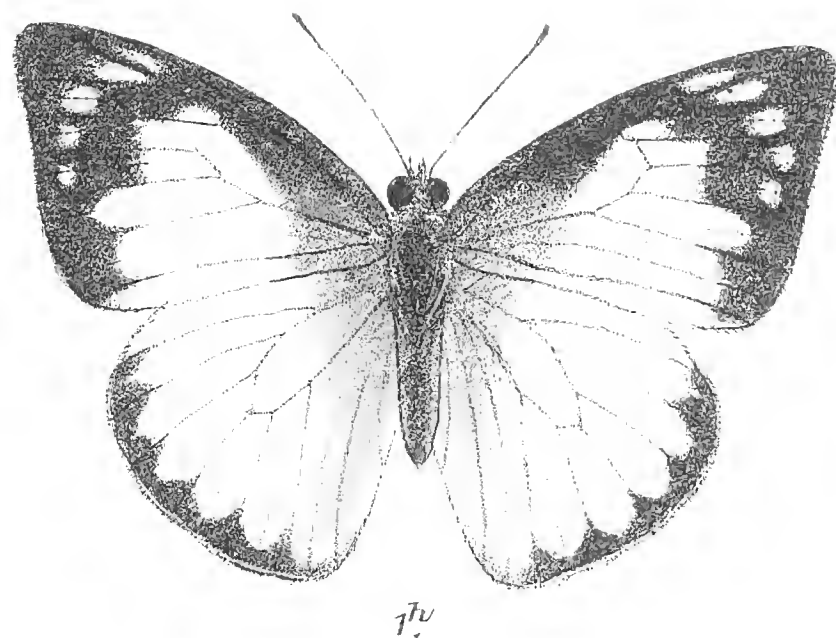
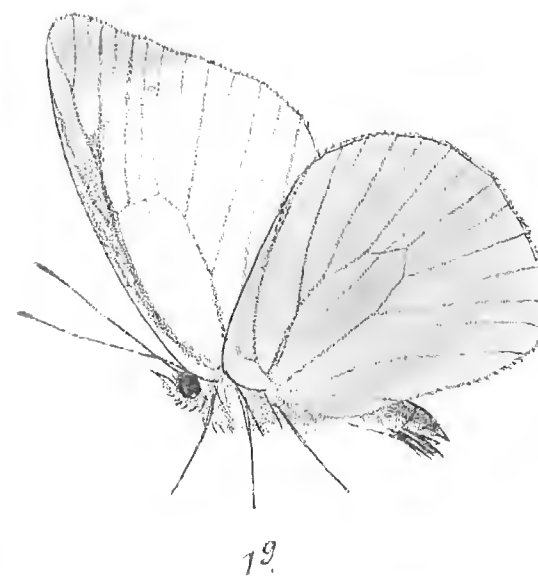
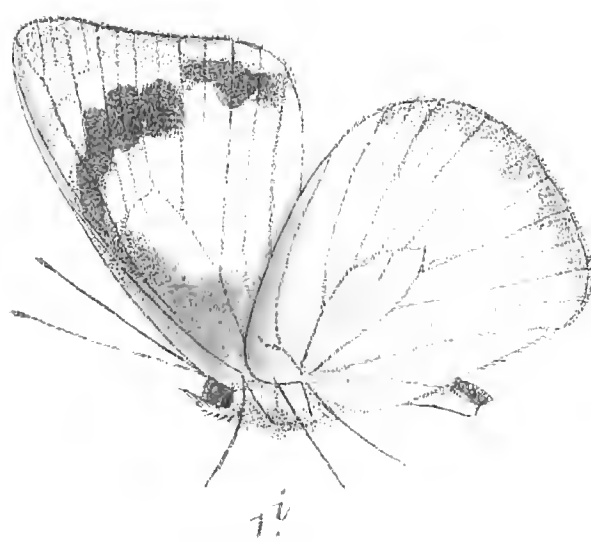
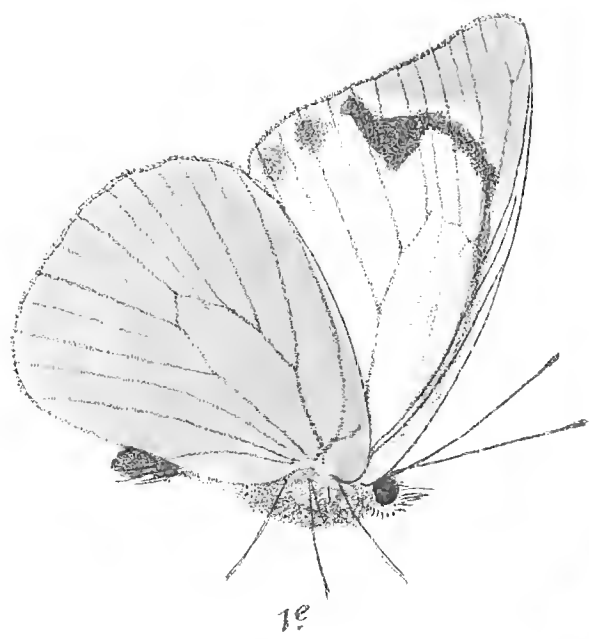
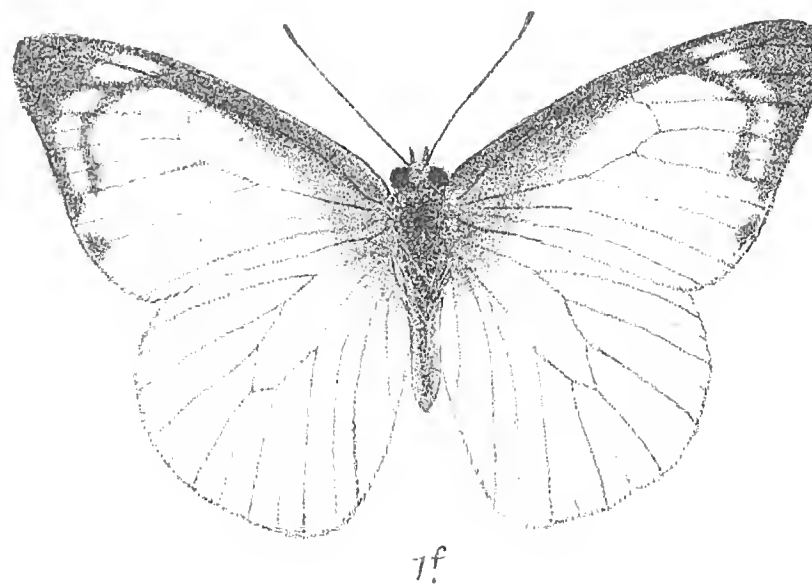
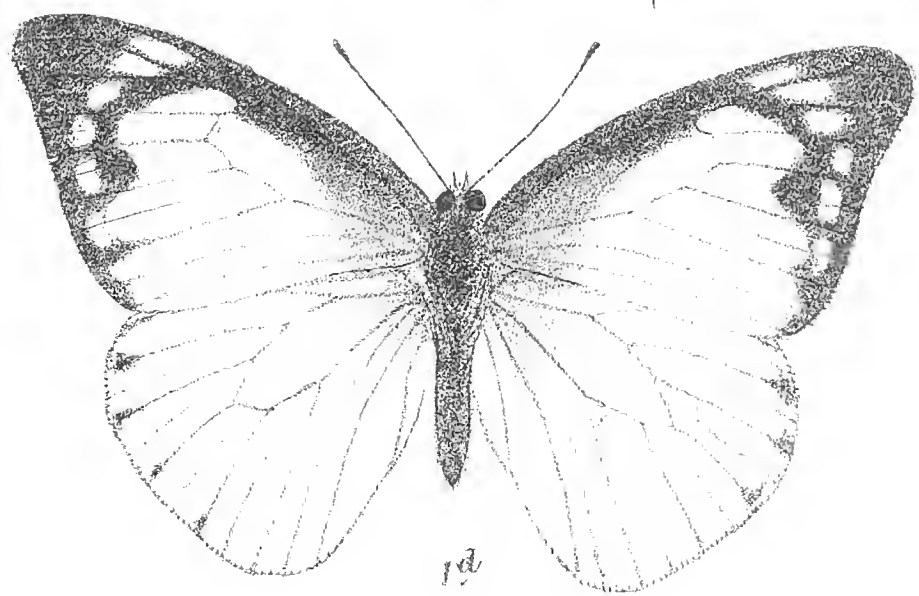
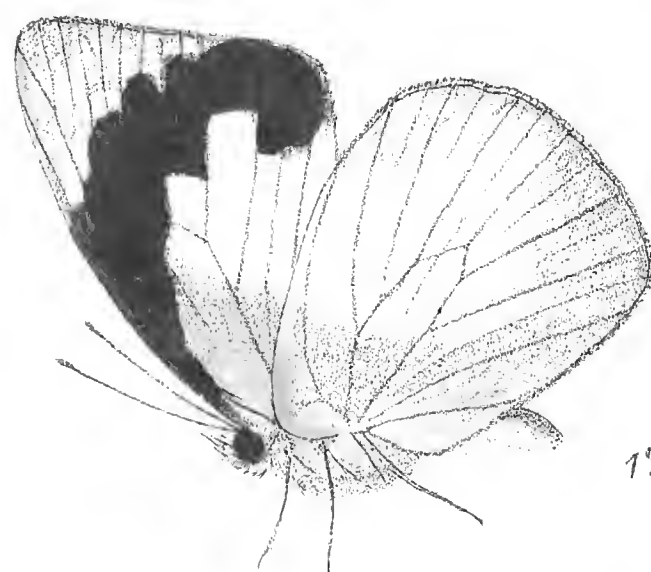
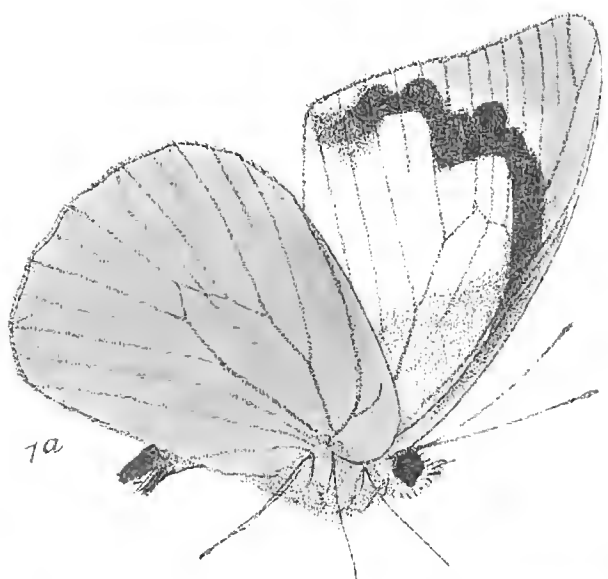
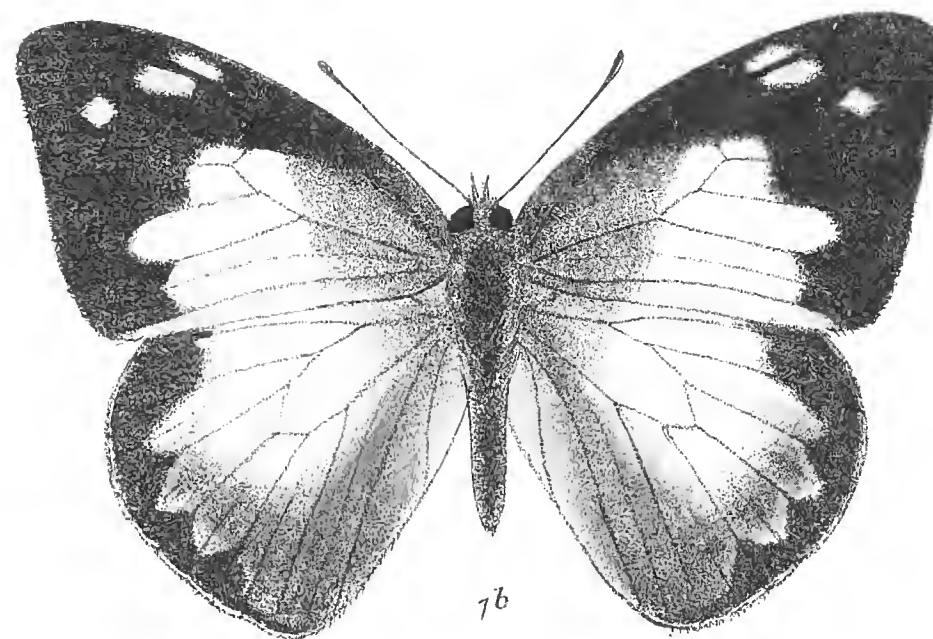
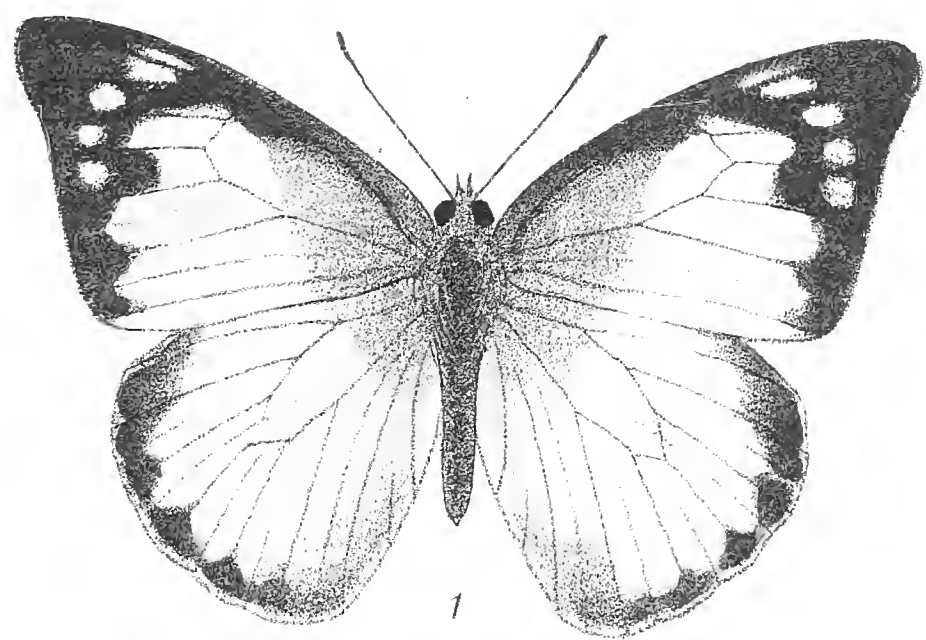
Trigonia, Geyer, Hübner's Zutr. v. p. 21 (1837), preoccupied.

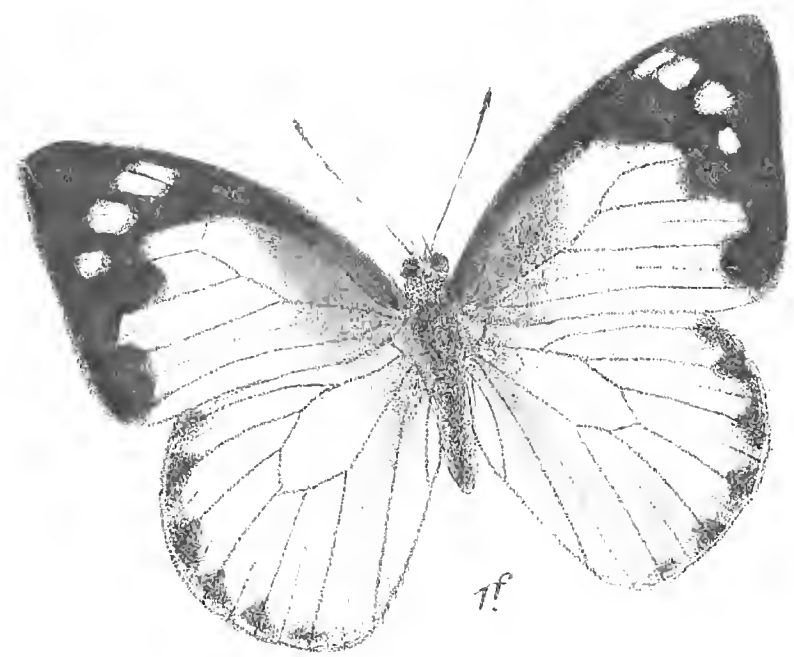
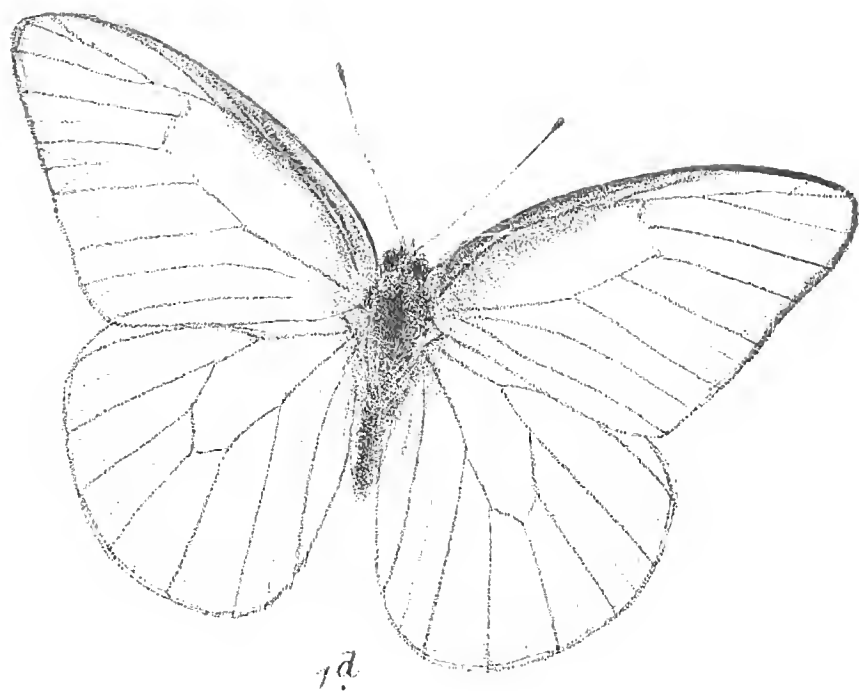
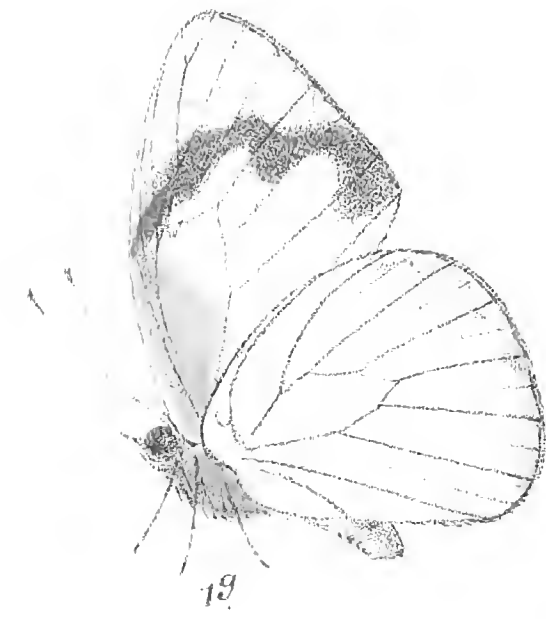
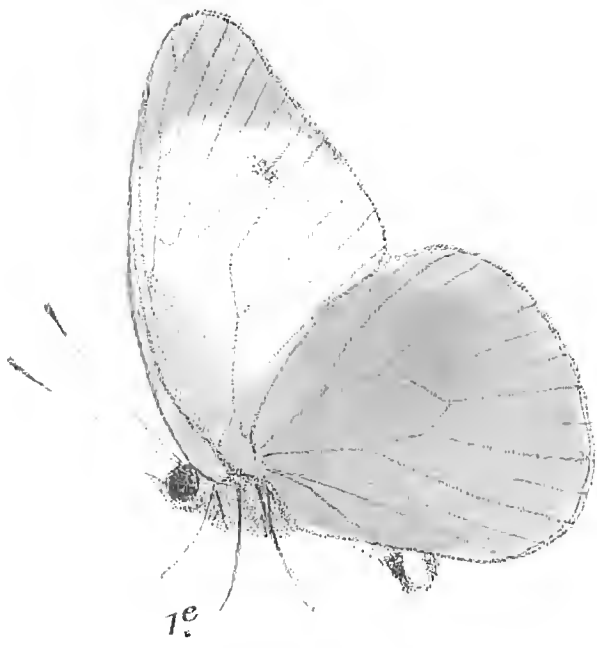
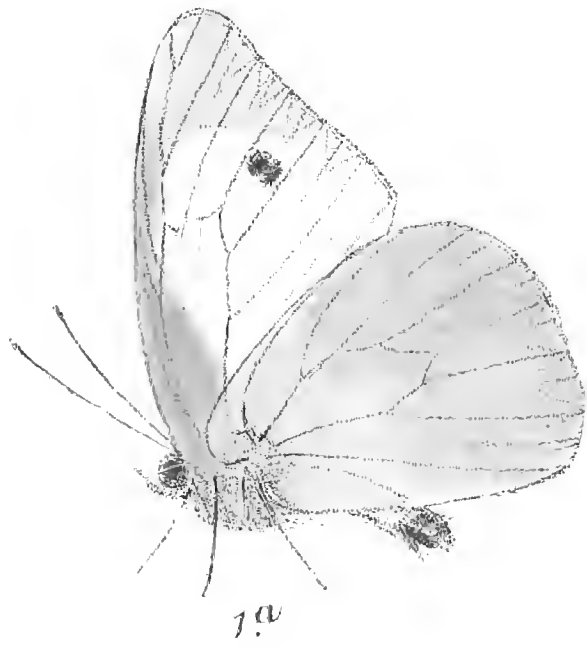
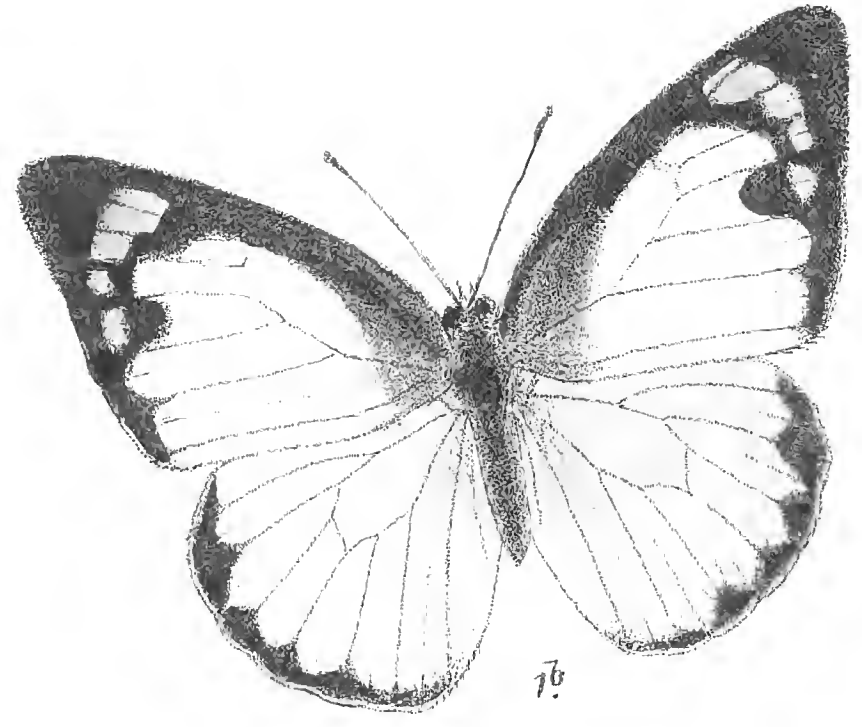
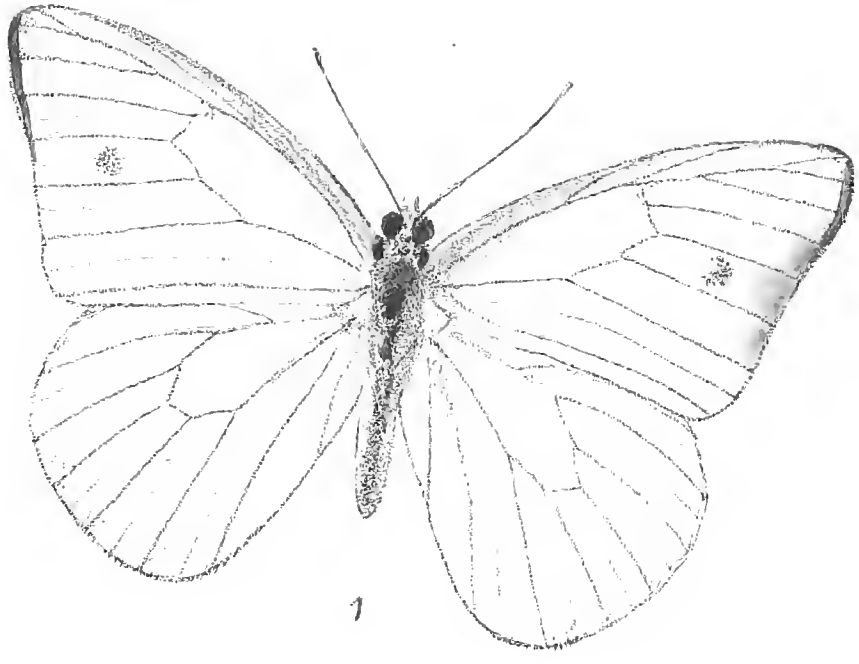
Male. *Forewing* triangular; costa arched from the base, apex obtuse; third subcostal furcated at one-fifth from the apex. *Hindwing* triangularly-oval, exterior margin very convex. Anal tufts long.

TYPE.—T. Nero.

HABITS.—Mr. H. O. Forbes (Wanderings Eastern Archipelago, p. 227) writes: "This species, as observed in Sumatra, is found in the open paths and sunny roads, often flying in flocks of over a score, exactly matching in colour the fallen leaves, which it was amusing to observe how often they mistook for one of their fellows at rest, and to watch the futile attentions of an amorous male towards such a leaf moving slightly in the wind." Dr. L. Martin says "males are not rare in N.E. Sumatra, in large forest, and frequent wet spots on roads. Females are very rare. It is found throughout the year, and over the whole of our area, except in the higher



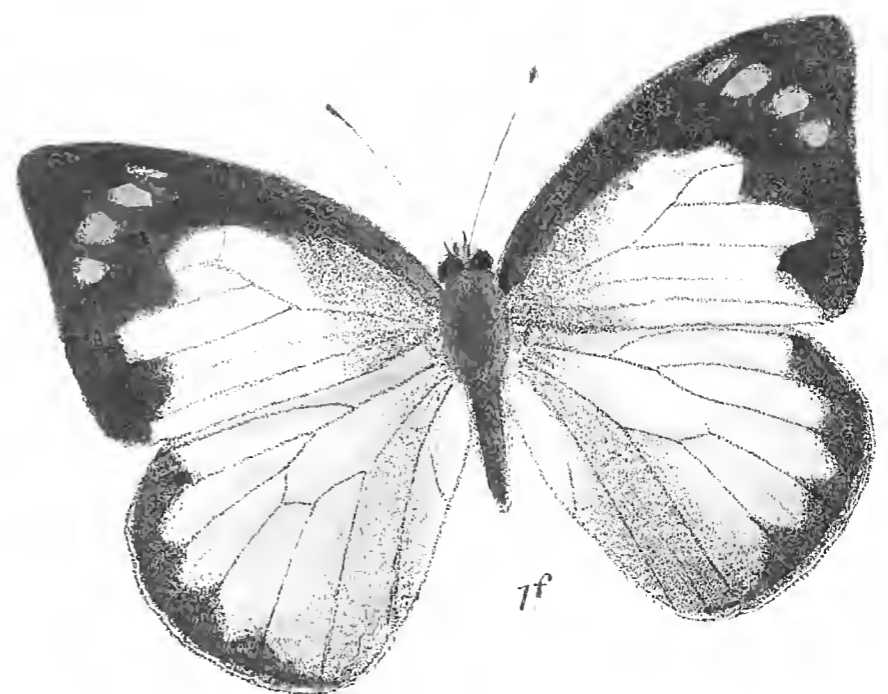
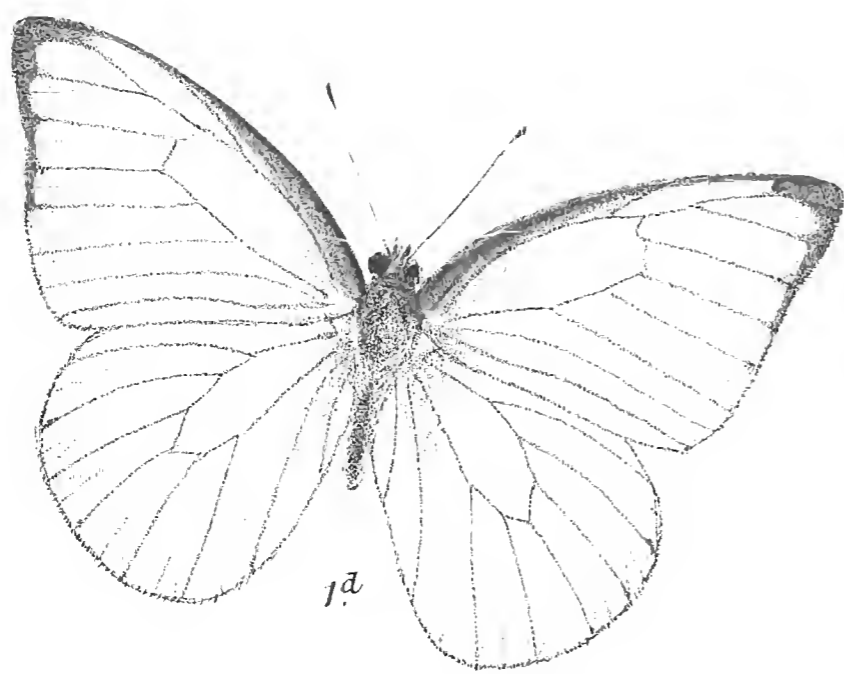
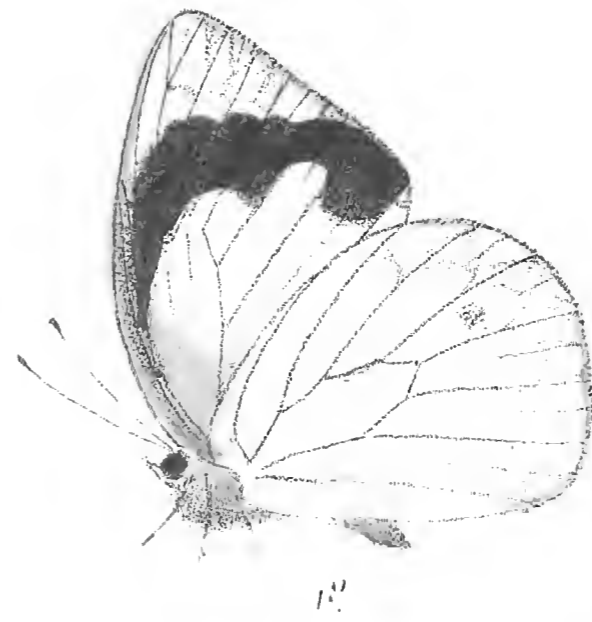
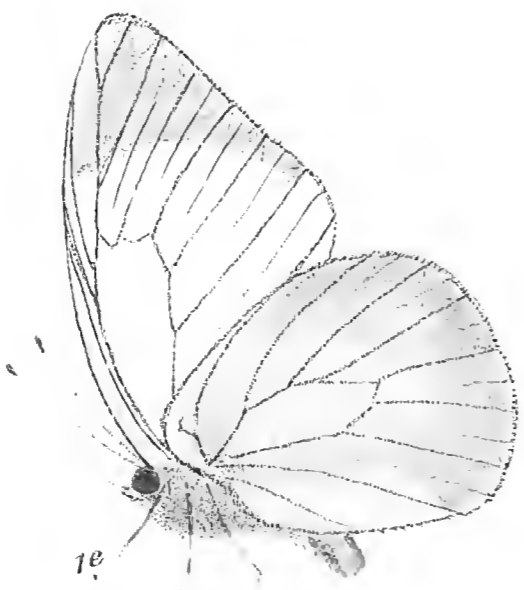
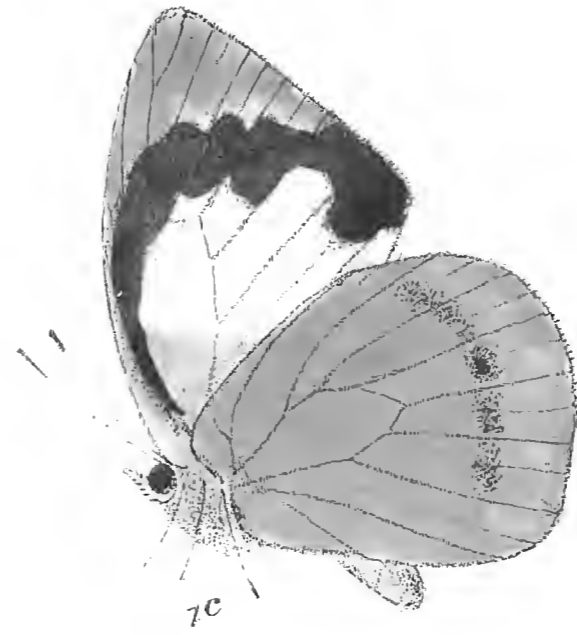
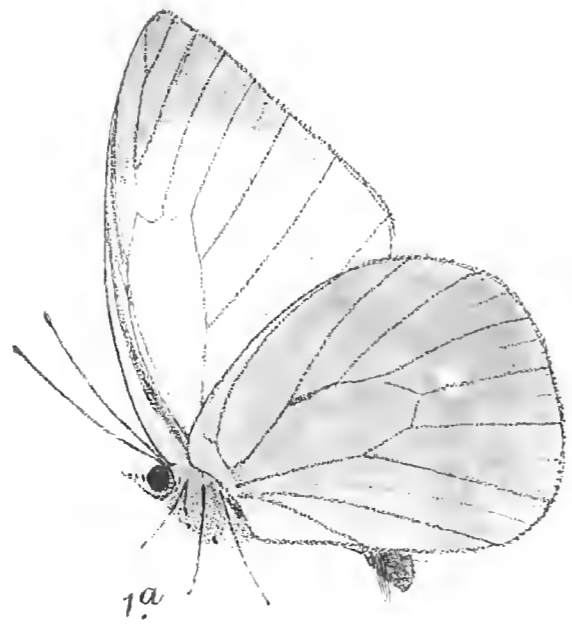
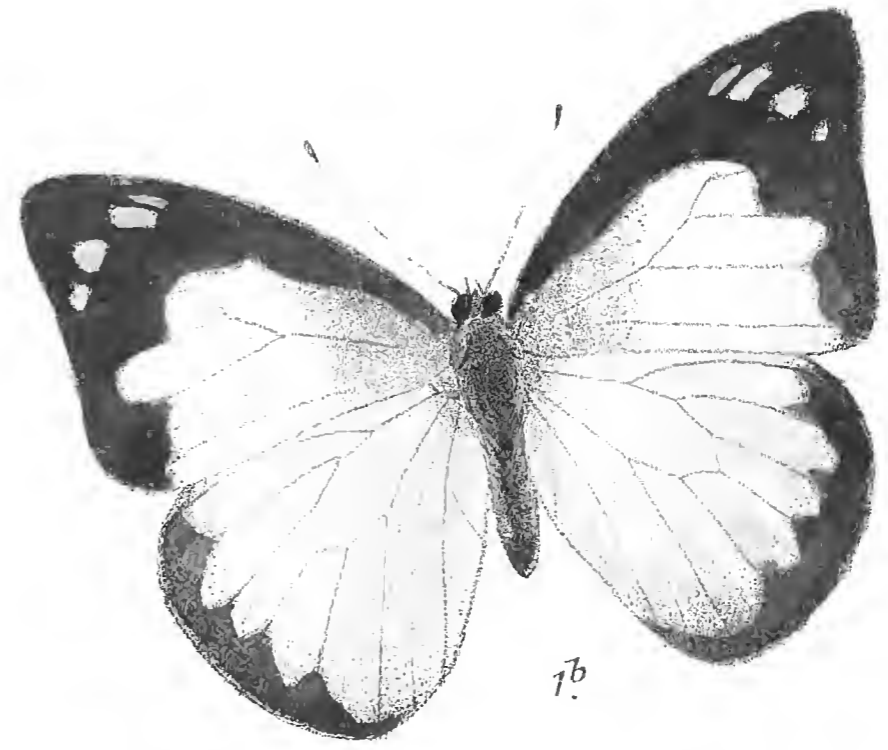




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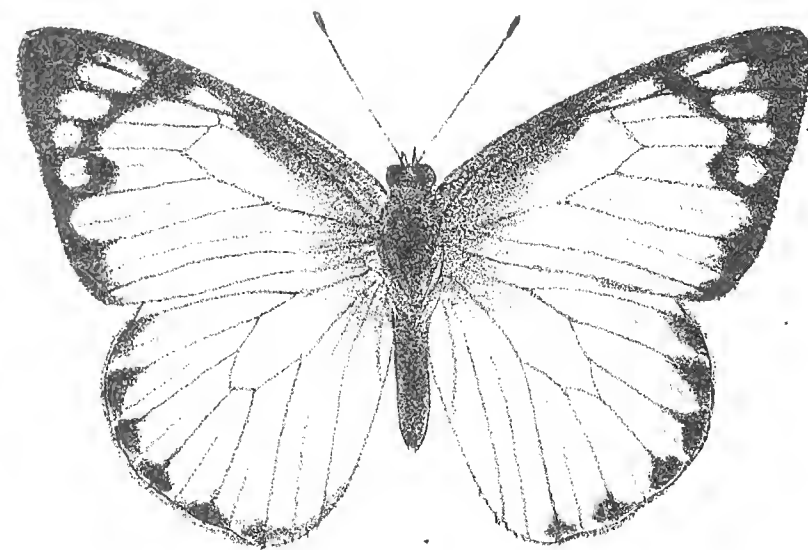
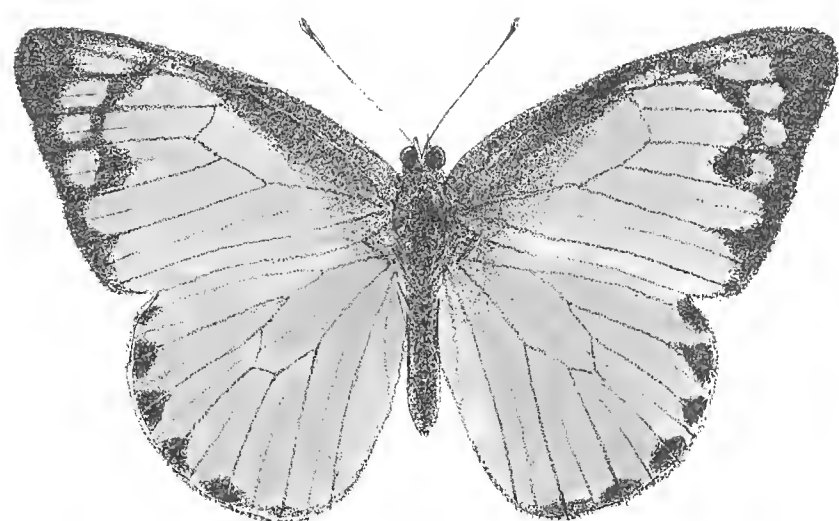
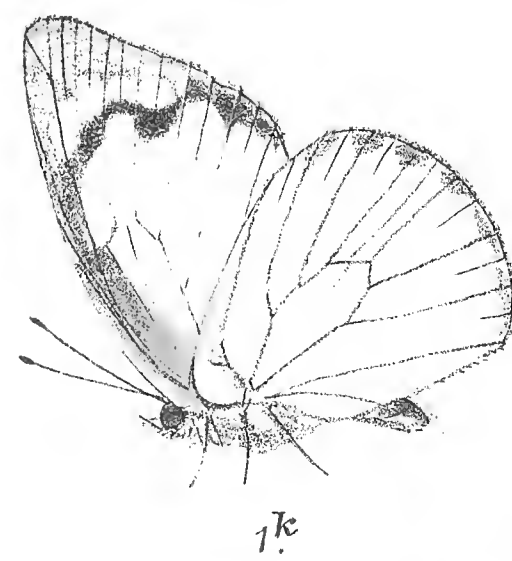
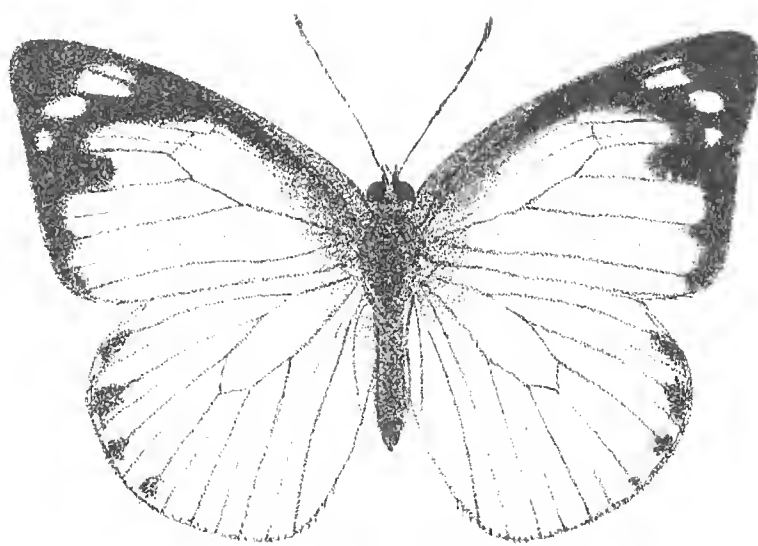
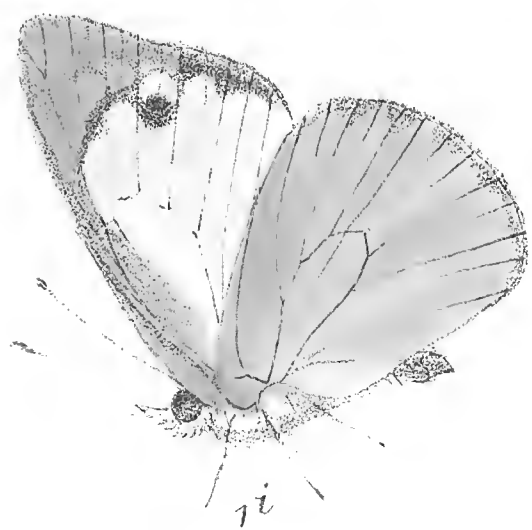
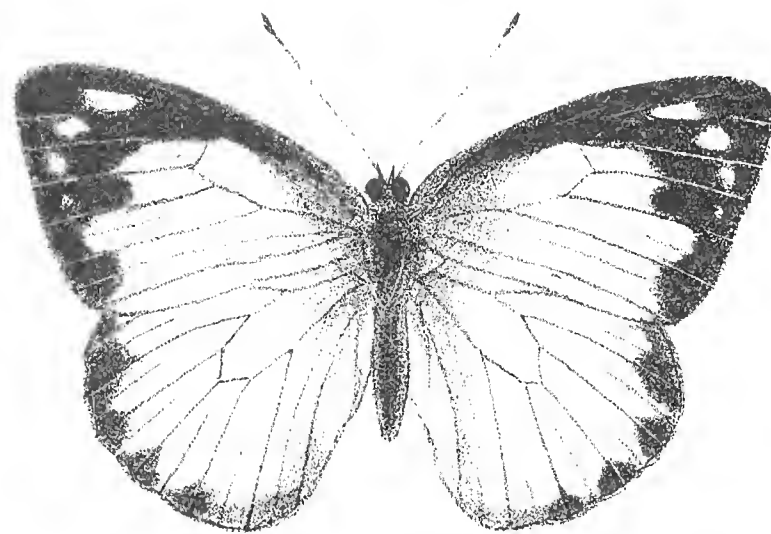
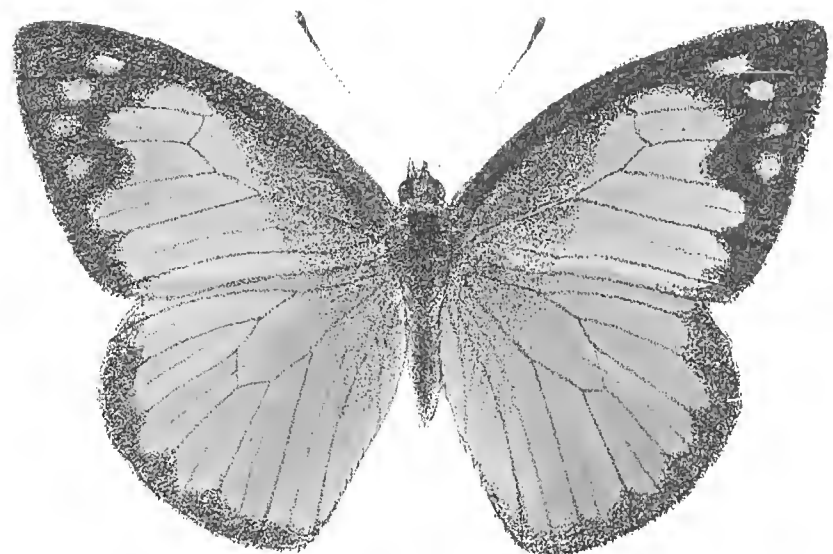
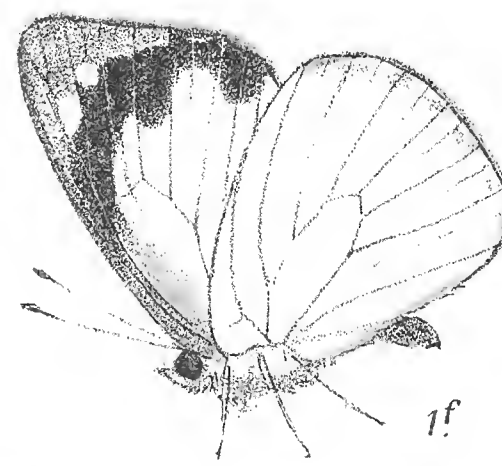
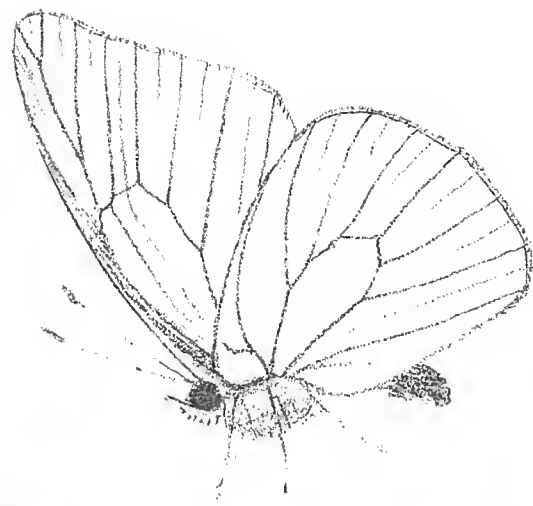
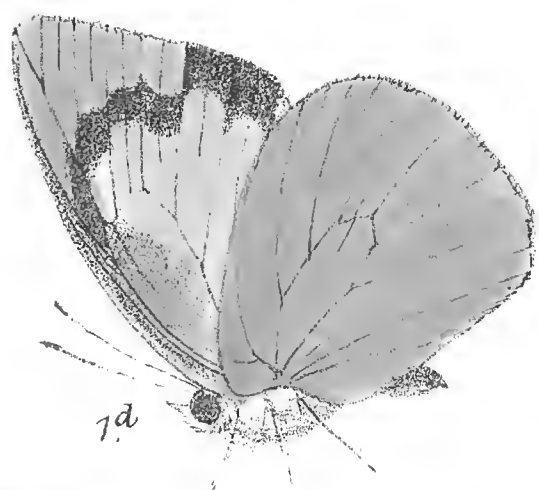
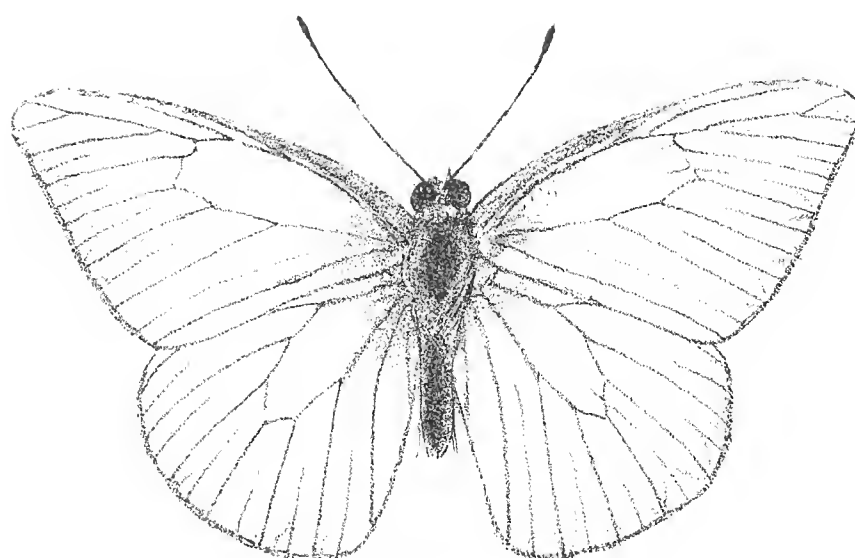
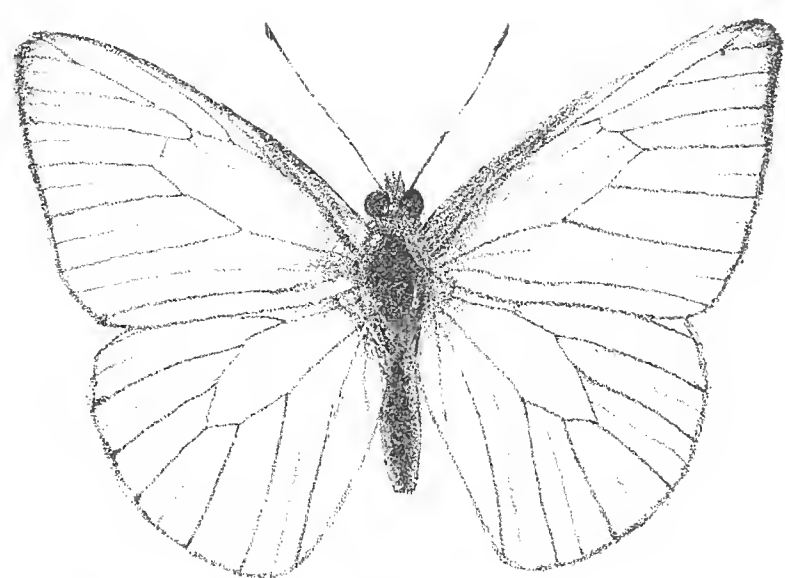
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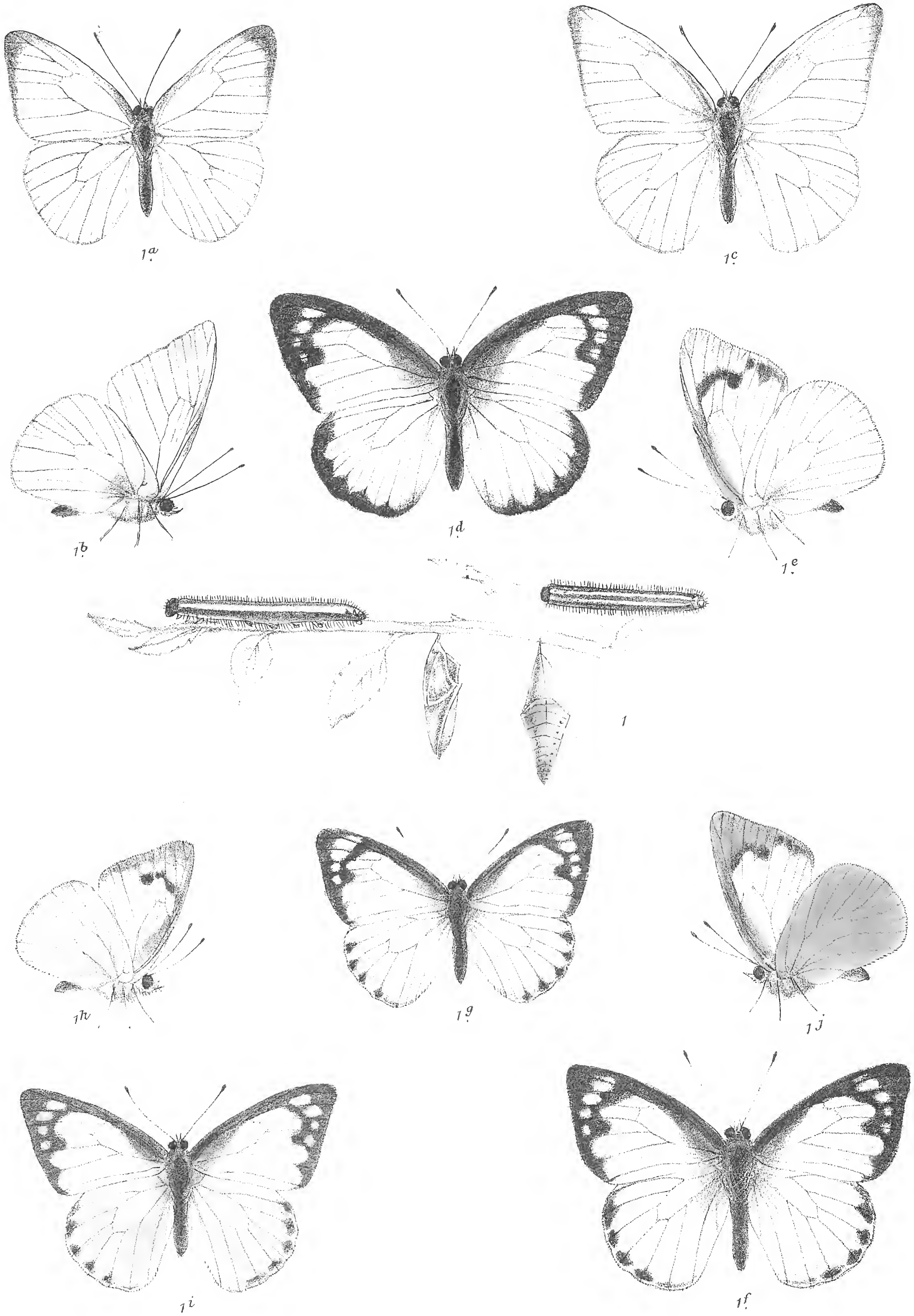


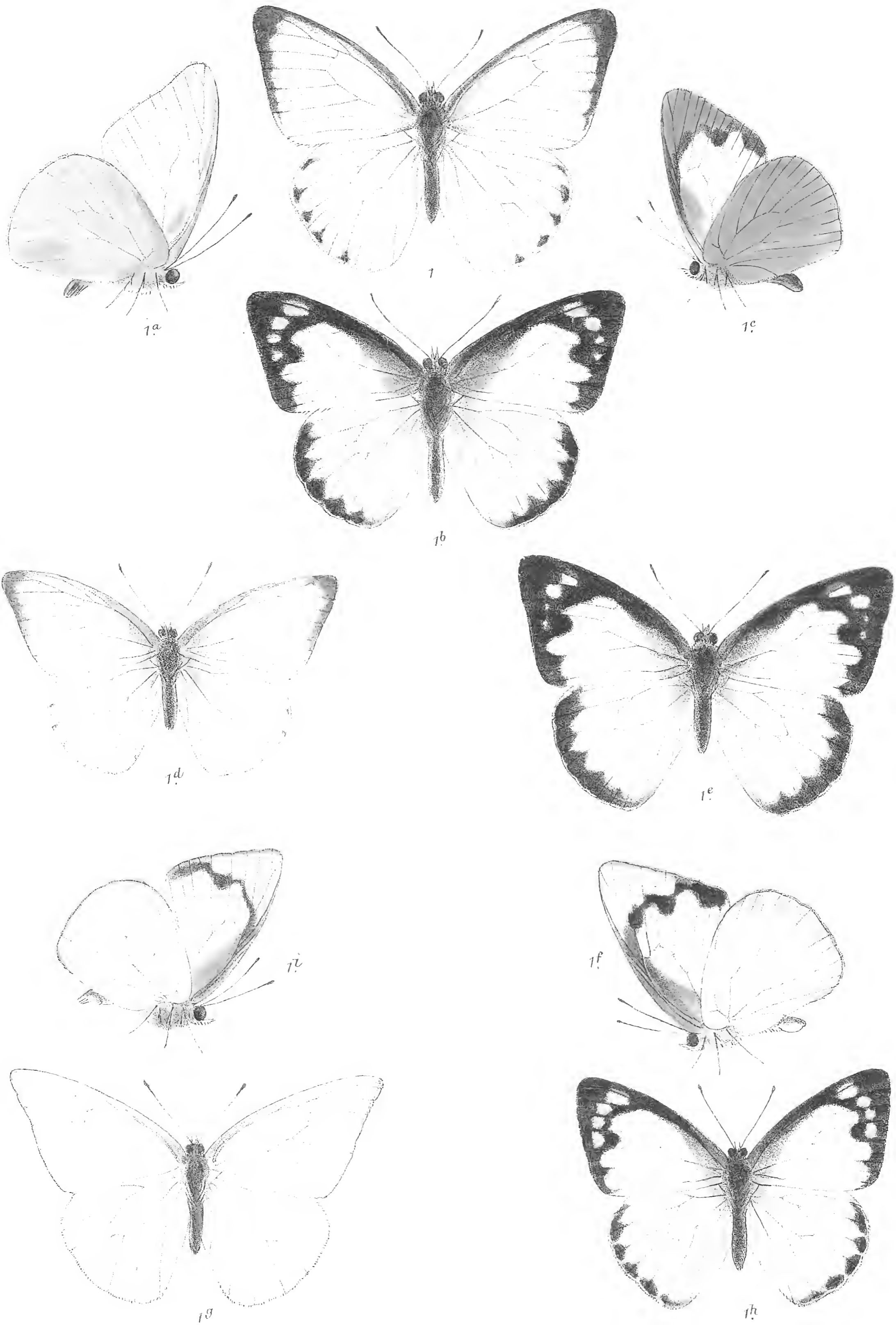
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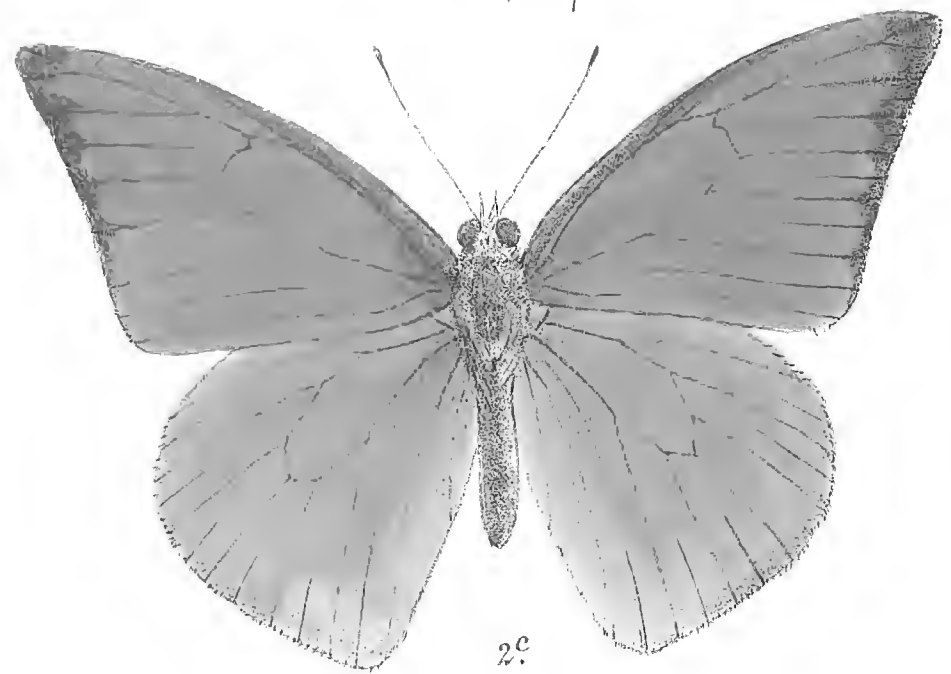
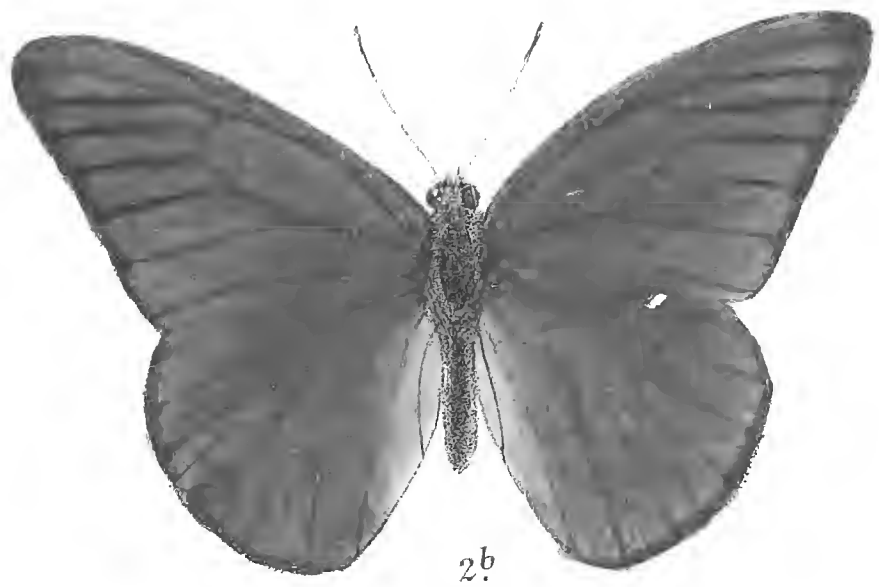
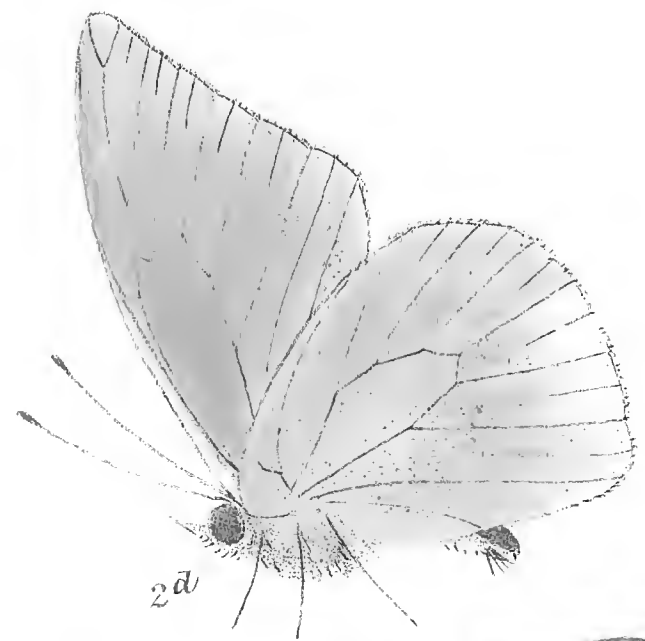
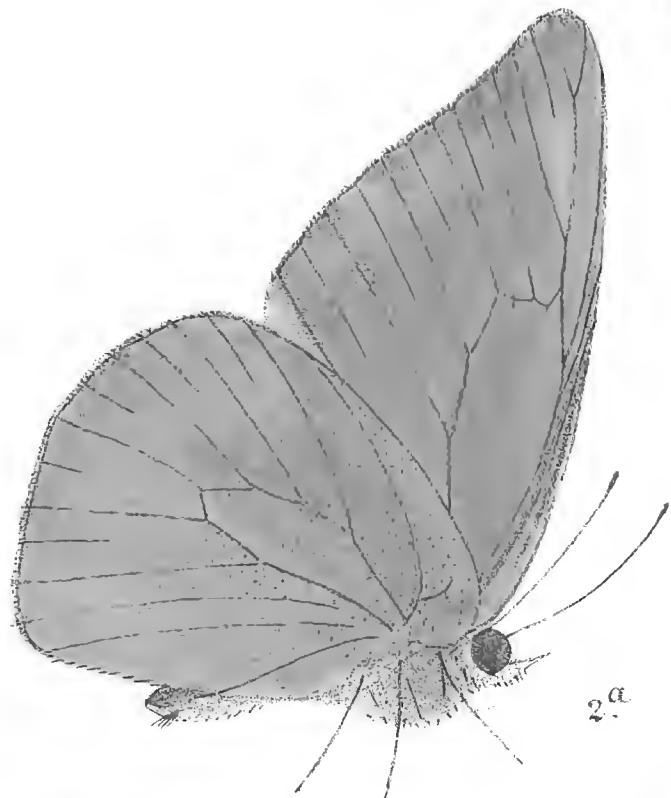
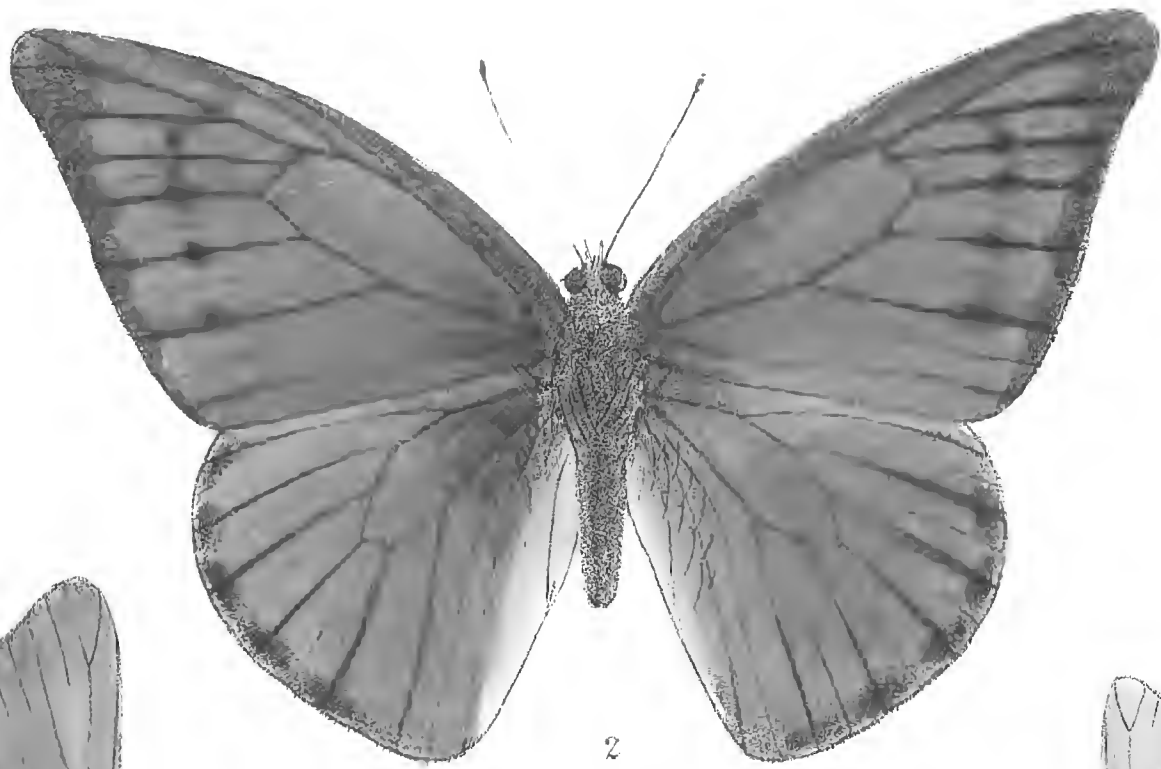
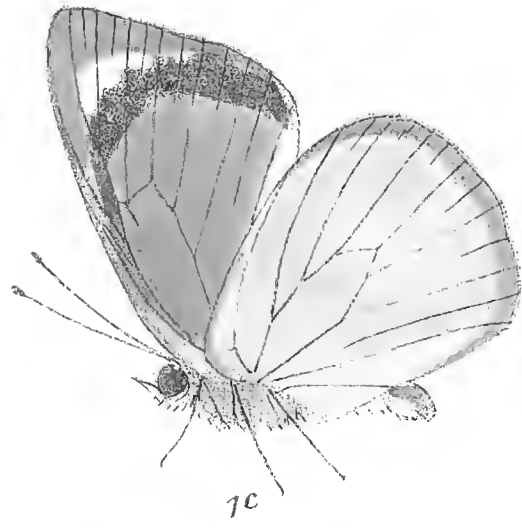
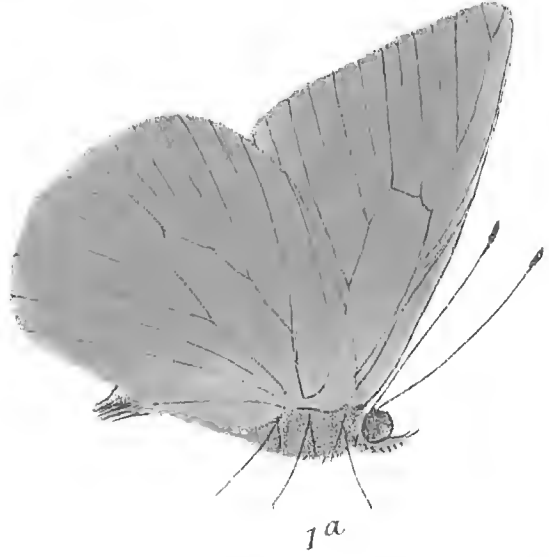
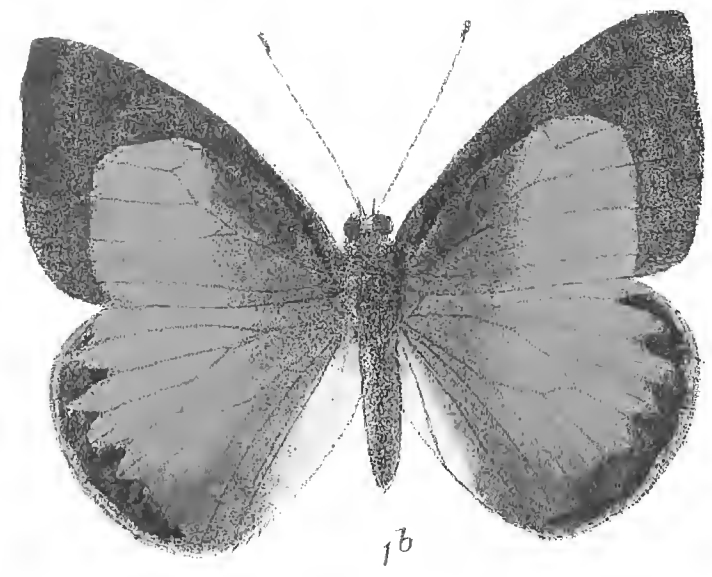
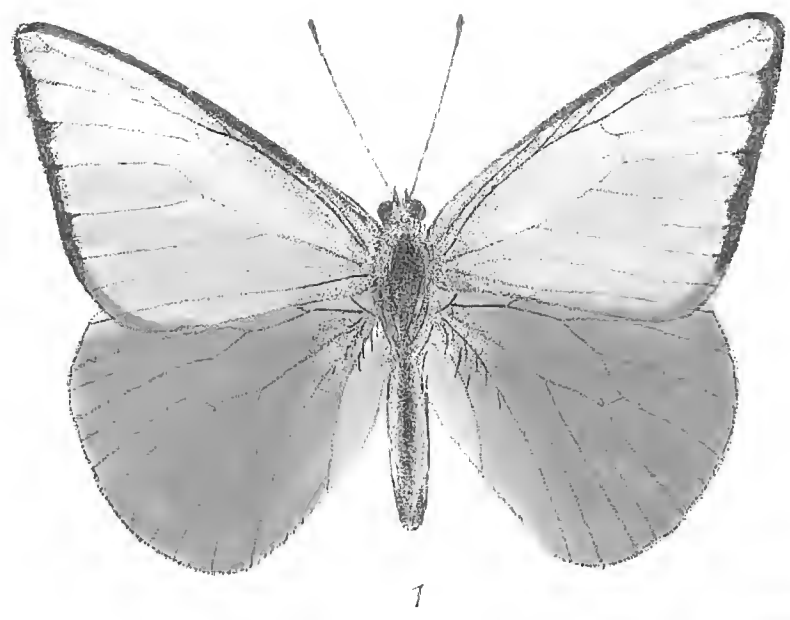




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