

OL
556
M7X
v. 9, pt. 97
Ent

(^{v. 9}Part XCVII.) 97

Price 10s. plain, 15s. coloured.

LEPIDOPTERA INDICA.

COL. C. SWINHOE, M.A., F.L.S., F.Z.S., F.E.S.,

MEMBER OF THE BOMBAY NATURAL HISTORY SOCIETY AND OF THE ENTOMOLOGICAL SOCIETY OF FRANCE.

Moore, Frederick



LONDON:
LOVELL REEVE & CO., LTD.,
PUBLISHERS TO THE HOME, COLONIAL AND INDIAN GOVERNMENTS,
6, HENRIETTA STREET, COVENT GARDEN.

1911.

WORKS PUBLISHED BY LOVELL REEVE & CO., Ltd.,
6, HENRIETTA STREET, COVENT GARDEN, LONDON.

- Coral and Atolls; their History, Description, Theories of their Origin both before and since that of Darwin, the influence of Winds, Tides, and Ocean Currents in their Formation and Transformations, their present Condition. Products, Fauna, and Flora. By F. WOOD-JONES, B.Sc., F.Z.S. Numerous Illustrations, Plates and Maps. 24s.
- The Hepaticæ of the British Isles. By W. H. PEARSON. Complete in Two Vols., with 228 Plates, £4 10s. plain, £6 6s. coloured.
- The Natural History of Plants. By H. BAILLON, President of the Linnæan Society of Paris. Super-royal 8vo. Vols. I. to VIII., with 3545 Wood Engravings, 21s. each.
- The Botanical Magazine; Figures and Descriptions of New and Rare Plants suitable for the Garden, Stove, or Greenhouse. Fourth Series. Edited by D. PRAIN, C.I.E., LL.D., F.R.S. Director of the Royal Gardens, Kew. Vols. I. to VI., Royal 8vo, 42s. Published Monthly, with 6 Plates, 3s. 6d., coloured. Annual Subscription, 42s.
- A New and Complete Index to the Botanical Magazine. Vols. I.—CXXX., comprising the 1st, 2nd, and 3rd Series. To which is prefixed a History of the Magazine by W. BOTTING HEMSLEY. 21s.
- Catalogue of the Plants of Kumaon and of the Adjacent Portions of Garhwal and Tibet. By Lieut.-Gen. Sir RICHARD STRACHEY and J. F. DUTHIE. 5s.
- Handbook of the British Flora; a Description of the Flowering Plants and Ferns indigenous to, or naturalized in, the British Isles. For the use of Beginners and Amateurs. By GEORGE BENTHAM, F.R.S. Revised by Sir J. D. HOOKER, C.B., K.C.S.I., F.R.S., &c. Crown 8vo, 9s.
- Illustrations of the British Flora; a Series of Wood Engravings, with Dissections of British Plants, from Drawings by W. H. FITCH, F.L.S., and W. G. SMITH, F.L.S., forming an Illustrated Companion to BENTHAM'S "Handbook," and other British Floras. 7th Edition. 1315 Wood Engravings, 9s.
- Outlines of Elementary Botany, as Introductory to Local Floras. By GEORGE BENTHAM, F.R.S., F.L.S. New Edition, 1s.
- Flora of Hampshire, including the Isle of Wight, with localities of the less common species. By F. TOWNSEND, M.A., F.L.S. 2nd Edition. With Coloured Map and two Plates, 21s.
- Materials for a Flora of the Malayan Peninsula. By H. N. RIDLEY, M.A., F.R.S., Director of Botanic Gardens, Singapore. Complete in Three Parts, 30s.
- Flora of British India. By Sir J. D. HOOKER, K.C.S.I., C.B., F.R.S., &c.; assisted by various Botanists. Complete in Seven Vols., £12. Published under the authority of the Secretary of State for India in Council.
- Flora Australiensis; a Description of the Plants of the Australian Territory. By GEORGE BENTHAM, F.R.S., assisted by FERDINAND MUELLER, F.R.S., Government Botanist, Melbourne, Victoria. Complete in Seven Vols., £7 4s. Published under the auspices of the several Governments of Australia.
- Handbook of the New Zealand Flora; a Systematic Description of the Native Plants of New Zealand, and the Chatham, Kermadec's, Lord Auckland's, Campbell's and Macquarrie's Islands. By Sir J. D. HOOKER, K.C.S.I., F.R.S. 42s. Published under the auspices of the Government of that Colony.
- Flora of Mauritius and the Seychelles; a Description of the Flowering Plants and Ferns of those Islands. By J. G. BAKER, F.L.S. 24s. Published under the authority of the Colonial Government of Mauritius.
- Flora of Tropical Africa. By DANIEL OLIVER, F.R.S., F.L.S. Vols. I. to III., 20s. each. The continuation edited by Sir W. T. THISELTON-DYER. Vol. IV., Sect. 1, 30s.; Sect. II., 27s. Vol. V., 25s. 6d. Vol. VI., Parts I. & II., 8s. Vol. VII., 27s. 6d. Vol. VIII., 25s. 6d. Published under the authority of the Secretary of State for the Colonies.
- Flora Capensis; a Systematic Description of the Plants of the Cape Colony, Caffraria, and Port Natal. By W. H. HARVEY, M.D., F.R.S., and O. W. SONDER, Ph.D. Vols. I. to III., 20s. each. The continuation edited by Sir W. T. THISELTON-DYER, Vol. IV., Section 1, 52s. Section 2, 24s. Vol. V., Parts I. & II., 9s. Vol. VI., 24s. Vol. VII., 33s.
- Flora of the British West Indian Islands. By Dr. GRISEBACH, F.L.S. 42s. Published under the auspices of the Secretary of State for the Colonies.
- A Second Century of Orchidaceous Plants, selected from the Subjects published in Curtis's "Botanical Magazine" since the issue of the "First Century." Edited by JAMES BATEMAN, Esq., F.R.S. Royal 4to, 100 Coloured Plates, £5 5s. Dedicated by Special Permission to H.R.H. the Princess of Wales.
- Monograph of Odontoglossum, a Genus of the Vandeous Section of Orchidaceous Plants. By JAMES BATEMAN, Esq., F.R.S. Imperial folio, with 30 Coloured Plates, £6 16s. 6d.
- The Rhododendrons of Sikkim-Himalaya; being an Account, Botanical and Geographical, of the Rhododendrons recently discovered in the Mountains of Eastern Himalaya by Sir J. D. HOOKER, F.R.S. By Sir W. J. HOOKER, F.R.S. Folio, 20 Coloured Plates, £4 14s. 6d.

LOVELL REEVE & CO., LTD., 6, HENRIETTA STREET, COVENT GARDEN.

LEPIDOPTERA INDICA.

Sub-Family HORAGINÆ.

EYES naked in the genera *Rathinda* and *Horaga*, hairy in *Catapæcilma*, which forms a link between the sub-families *Ruralinæ* and *Horaginæ*, having the hairy eyes of the former, and the neuration and three filamentous tails of the latter; all are purely oriental, colour above brown, purple and black with blue markings, all have three slender tails at the ends of veins 2, 3 and 4, the middle tail the longest, the outer one the shortest, the inner tail generally twice as long, the middle tail twice as long again. *Catapæcilma* and *Rathinda* have no secondary sexual characters, but in all the known Indian species of *Horaga* (except *H. viola* and *H. albomacula*) there is on the underside of the forewing of the male an oval glandular patch of closely packed scales, on or near the middle of the sub-median nervure, the hinder margin of the wing being bowed outwards opposite this patch; all have but two sub-costal nervules.

Genus CATAPÆCILMA.

Catapæcilma, Butler, Trans. Linn. Soc. Zool. 1877, p. 547. Moore, Lep. Ceylon, i. p. 97 (1881).
Distant, Rhop. Malayana, p. 234 (1884). de Nicéville, Butt. of India, iii. p. 420 (1890).

Eyes hairy. *Forewing* with vein 2 emitted a little beyond the middle, 3 from about one-fifth before lower end of cell, 10 from about one-fourth before upper end of cell, 11 from the middle of the cell, 8 and 9 absent, 12 terminates on the costa opposite the end of the cell, wing sub-triangular, costal margin slightly convex, apex obtuse, outer margin somewhat convex and scalloped, hinder margin slightly concave and sinuous. *Hindwing*, veins 2 and 3 emitted close together near the lower end of the cell, 7 bifurcate, from about one-third before upper end, 8 extends to the apex of the wing, costal margin convex at base, then nearly straight to the apex, which is rounded, posterior margin very slightly scalloped, with three slender tails.

Type, *Hypochrysops elegans*, Druce.

CATAPŒCILMA ELEGANS.

Plate 706, figs. 1, ♂, 1a, ♀, 1b, ♂, 1c, larva and pupa.

Hypochrysops elegans, Druce, Proc. Zool. Soc. 1873, p. 350, pl. 32, fig. 12, ♀.

Catapœcilma elegans, Butler, Trans. Linn. Soc. Zool. 1877, p. 548. Moore, Lep. Ceylon, i. p. 98, pl. 39, figs. 3, 3a, ♂ (1881). Distant, Rhop. Malayana, p. 235, pl. 22, fig. 17, ♂ (1884), Staudinger, Ex. Schmett. p. 282, pl. 96, ♀ (nec ♂), (1888). Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 368, pl. 15, fig. 6, ♂. Hampson, id. 1888, p. 358. de Nicéville, Butt. of India, iii. p. 421, pl. 29, fig. 228, ♀ (1890); id. Journ. Bo. Nat. Hist. Soc. 1890, p. 386. Elwes, Proc. Zool. Soc. 1892, p. 641. Swinhoe, Trans. Ent. Soc. 1893, 305. H. H. Druce, Proc. Zool. Soc. 1895, p. 612. Davidson, Bell and Aitken, Journ. Bo. Nat. Hist. Soc. 1896, p. 389, pl. 5, figs. 8, 8a, larva and pupa. Watson, id. 1897, p. 667. Mackinnon and de Nicéville, id. 1898, p. 388. Aitken and Comber, id. vol. xv. 1903, p. 49.

IMAGO.—Male. Upperside dark violet-blue. *Forewing* with a black costal line and narrow black costal band, with a series of black lunular spots on the outer margin, anal spot black, the black spots in the next two interspaces prominent, the anal spot and the next one edged on both sides with glistening silvery scales, the other with pale bluish-white. Cilia of both wings white with black spots at all the vein ends. Underside pale greyish-chocolate, markings darker, chocolate-brown, ornamented with brilliant metallic scales, which are blue-green in some lights, silvery-white in others. *Forewing* with several sub-basal spots, a medial transverse band, commencing in a curved double form of irregular spots more or less conjoined, which end on the median vein outside the cell with a thick streak below the middle of their ends, the streak narrowing hindwards to a point in the pale hinder marginal space. A sub-marginal broken band, commencing singly from the costa in a similar form, with a thick streak below it, like the middle streak and parallel with it; a series of sub-marginal ringed spots. *Hindwing* with the inner portion suffused with dark chocolate-brown, a number of larger sub-basal spots, two bars closing the cell, followed closely by three lines of lunular marks and two below the cell bars, a series of small sub-marginal spots, a black anal spot and another in the first interspace. All these markings very difficult to describe. Antennæ black, ringed with white, the club with an orange tip; head and body above and below concolorous with the wings.

Female. Upperside pale violet. *Forewing* with broad costal and outer marginal black borders, narrowing somewhat on the costa towards the base. *Hindwing* with the costal space broadly blackish, veins blackish, outer margin with blackish spots, a white anteciliary line, terminal line black. Cilia of both wings violet, with white tips.

Expanse of wings, ♂ ♀ $1\frac{2}{10}$ to $1\frac{4}{10}$ inches.

LARVA, feeds on "kindal" (*Terminalia paniculata*), is onisciform, flattened, head and tail segments looking very similar; head completely concealed; it is roughish in

texture, but not pubose; colour dirty green, with a patch of dark green in the centre of the back; it is also a good deal mottled everywhere.

PUPA, fastened by the tail along a leaf, narrow, without projections of any kind; of a greenish-brown, minutely dotted with darker brown. (Davidson, Bell and Aitken.)

HABITAT.—India, Burma, Ceylon, Malay Peninsula, Borneo, Sumatra.

DISTRIBUTION.—The type came from Borneo, Wood-Mason and de Nicéville record it from Cachar, Mackinnon and de Nicéville from Mussuri, 3,000 feet elevation, Moore from Ceylon, Distant from the Malay Peninsula, Elwes from the Karen Hills, Watson from the Chin Hills, Aitken and Comber from Bassein and Thanna, near Bombay, Hampson from the Nilgiris, de Nicéville from Chin Lushai, Orissa, Cannanore, South India, the Shevroy Hills, Mergui and Myitta in Tenasserim; we have it from Sikkim, and have received many examples from the Khasia Hills; our description and figures are from a Khasia Hill pair; it is in the B. M. also from Sumatra.

CATAPÆCILMA DELICATUM.

Plate 706, figs. 2, ♂, 2a, ♀, 2b, ♂.

Catapæcilma delicatum, de Nicéville, Proc. Zool. Soc. 1887, p. 455; id. Butt. of India, iii. p. 422 (1890).

Catapæcilma bubases, de Nicéville (nec Hewitson), Journ. As. Soc. Bengal, 1885, p. 118, pl. 2, fig. 11, ♂, 1, ♀.

IMAGO.—Male. Upperside, both wings smoky purplish-black, obscurely shot with purple in some lights. *Forewing* with the lower discal and basal areas powdered with dull blue scales, which are obsolete in some specimens. *Hindwing* with two very fine silvery lines on the margin of the anal angle. Tail black, tipped with white. Cilia blackish, marked with white towards the anal angle of the forewing, and throughout the hindwing. Underside, both wings chrome-yellow, densely and evenly striated with black, and with scattered greenish-silvery metallic spots and streaks, some of which form a marginal series.

Female. Upperside. *Forewing* pale blue, with the costa, apex widely, and the outer margin blackish. *Hindwing* with all but the outer margin, which is blackish, pale blue; towards the anal angle there is first a fine blue line, then a yellow one defined on both sides with a black one, and then another pale blue line. Underside, both wings as in the male. (de Nicéville.)

Expanse of wings, ♂ ♀ $1\frac{2}{10}$ inches.

HABITAT.—Sikkim.

CATAPÆCILMA SUBOCHREA.

Plate 706, figs. 3, ♂, 3a, ♀.

Catapæcilma subochrea, Elwes, Proc. Zool. Soc. 1892, p. 640, pl. 44, fig. 10, ♂.

IMAGO.—Male. Two males of this lovely species were taken by Doherty at Thandaung, in the Karen Hills, at about 4,500 feet elevation, in April, 1890. They appear to be quite distinct from *C. elegans*, which was found in the same locality and may be distinguished best by the colour and arrangement of the beautiful markings of the underside, which are easier to figure than to describe. On the upper side the colour is a little brighter than in *C. elegans*, the black border of the forewings not broader at the apex; from *C. bubases*, Hew., it is distinguished by the absence of a costal border on the forewing, it is smaller in size and the different markings below. (Elwes.)

Expanse of wings, ♂ $1\frac{3}{10}$ inches.

HABITAT.—Karen Hills.

There is a male in the B. M. from the Shan States.

INDO-MALAYAN ALLIED GENERA AND SPECIES.

Catapæcilma? bubases, Hypochrysop *bubases*, Hewitson, Ent. Mo. Mag. xii. p. 38 (1875).

Catapæcilma bubases, Distant, Rhop. Malayana, p. 459, pl. 44, fig. 26 (1886). Habitat, Malacca.

Catapæcilma niasana, *Catapæcilma elegans niasana*, Frühstorfer, Berl. Ent. Zeit. 1899, p. 157. Habitat, Nias.

Semanga superba, *Ilerda? superba*, Druce, P.Z.S. 1873, p. 350, pl. 32, fig. 11. *Semanga superba*, Distant, Rhop. Malayana, p. 239, pl. 21, fig. 13, ♀ (1884). Habitat, Malacca, Borneo.

Genus RATHINDA.

Rathinda, Moore, Lep. Ceylon, i. p. 99 (1881). de Nicéville, Butt. of India, iii. p. 413 (1890).

Eyes naked. *Forewing*, veins 12, 11 and 10 well separated; 12 ends on costa opposite end of cell, 11 emitted at the middle of the cell, is slightly bowed upwards towards 12, from which, however, it is well separated, 10 from one-third, 8 and 9 absent, 6 from upper end of cell, discocellulars nearly erect, of equal length; vein 3 from a little before lower end of cell; wing short, triangular, costa arched, outer margin slightly convex. *Hindwing*, vein 7 emitted some distance before upper end of cell; discocellulars of equal length, outwardly oblique, the upper sinuous, the lower straight, vein 3 emitted just before lower end of cell, sub-median nervure straight, internal nervure with its base straight, lying close to the base of the

sub-median nervure, then suddenly bowed outwards, rather short; palpi of the female much longer than those of the male.

Type, *Papilio amor*, Fabricius.

RATHINDA AMOR.

Plate 706, figs. 4, ♂, 4a, ♀, 4b, ♂, 4c, d, larva and pupa.

Papilio amor, Fabricius, Syst. Ent. p. 518 (1775); id. Sp. Ins. ii. p. 113 (1781); id. Mant. Ins. ii. p. 65 (1787). Herbst, Pap. xi. p. 43, pl. 302, figs. 9, 10 (1804).

Hesperia amor, Fabricius, Ent. Syst. iii. (1), p. 260 (1793).

Polyommatus amor, Godart, Enc. Méth. ix. p. 620 (1823).

Zephyrus amor, Guérin-Ménéville, Icon. Reg. An. Ins. p. 490, pl. 81, fig. 6 (1844).

Myrina amor, Butler, Cat. Fabr. Lep. B. M. p. 184 (1869).

Rathinda amor, Moore, Lep. Ceylon, i. p. 99, pl. 42, figs. 1, 1a, pl. 34, fig. 1b, larva and pupa of *Spalgis epius*, ex errore (1881). Hampson, Journ. As. Soc. Bengal, 1888, p. 359. de Nicéville, Butt. of India, iii. p. 414, pl. 29, fig. 227, ♀ (1890). Davidson, Bell and Aitken, Journ. Bo. Nat. Hist. Soc. 1896, p. 389, pl. 5, figs. 7, 7a, larva and pupa. Aitken and Comber, id. vol. xv. 1903, p. 49.

Sithon amor, Staudinger, Ex. Schmett. p. 277, pl. 95, ♀ (1888).

Papilio triopus, Cramer, Pap. Exot. iv. pl. 320, figs. G, H (1780).

Myrina triopus, Horsfield and Moore, Cat. Lep. Mus. E.I.C. i. p. 49, pl. 12, figs. 7, larva, 7a, pupa (1857). Moore, Proc. Zool. Soc. 1865, p. 776.

IMAGO.—Male. Upperside brownish-black with a violet-tint. *Forewing* with a white spot (sometimes slightly ochreous) beyond the end of the cell, with two smaller spots in an outwardly oblique row from it. *Hindwing* with two black lunular spots between the tails and indications of a third black spot in the next upper interspace, all three capped with orange, with a fine blue thread on their outer sides; tails black, tipped with white. Cilia blackish, with white tips. Underside white, sometimes tinged with yellow; the markings pale chocolate. *Forewing* with the apical third chocolate, its inner edge in an even curve from the middle of the costa to the hinder margin near the angle, containing a sub-marginal series of small black lunules inwardly edged with white; the middle portion of the white space with some chocolate suffusion, a thin linear mark near the hinder angle, two short streaks from the base followed by three or four small spots. *Hindwing* with a lunulated, outwardly curved discal line, the inner wing space covered with spots and small lunular marks, a sub-marginal orange-yellow band, lined on its inner side with dark chocolate, on its outer side by metallic blue-green small spots, some pale chocolate suffusion near the apex, a black spot between the two upper tails, ringed with pale dull blue, white spots on each side of it, some white on the outside of the yellow band near the costa; both wings with a terminal, narrow, chocolate band ochreous tinted. Antennæ black, ringed with white; the club with an orange tip; head and body above and below concolorous with the wings.

Female, above and below like the male, but the white spots on the forewing above are larger.

Expanse of wings, ♂ ♀ 1 to $1\frac{3}{10}$ inches.

LARVA, pale green, the segments armed with elongated divergent processes. Feeds on *Euphorbiacæ* (Moore). Feeds on the flowers or young shoots of "*Pitkuli*" (*Eugenia zeylanica*), but also on *Hopea* and other things (we reared one on a common garden croton); is of a pale green, with a line of long, pink protuberances along the back, the last curved outwards and upwards, two protuberances curved outwards on the sides of the last segment, and on the fourth segment a straight, sharp-pointed one, low down laterally; the line of dorsal protuberances branches near the head into two.

PUPA, green, becoming browner as it nears the imago state, marked on the wing-covers and on the back of the abdomen with pink, perfectly smooth, fastened along a stalk by the tail only. (Davidson, Bell and Aitken.)

HABITAT.—Central and Southern India, Ceylon.

DISTRIBUTION.—We have it from Kandy and Trincomali, in Ceylon, also from Trevandrum. We took it in Bombay and Poona; Hampson records it from the Nilgiris, 2,000 to 4,000 feet elevation; Moore records it from Calcutta and Kanara; de Nicéville says there is a single example in the Indian Museum, Calcutta, from Sibsaghar, in Upper Assam, and that W. C. Taylor took it in Orissa, Minchin in Ganjam and Bangalore, and Wade at Kandy and Galle.

Genus HORAGA.

Horaga, Moore, Lep. Ceylon, i. p. 98 (1881). Distant, Rhop. Malayana, p. 459 (1886). de Nicéville, Butt. of India, iii. p. 414 (1890).

Eyes naked, in neuration very near to *Rathinda*. Veins 12, 11, and 10 lie closer together than they do in *Rathinda*, 12 ends on costa opposite the end of the cell, 11 emitted from the middle of the cell, and is only slightly bowed upwards towards 12, 10 at more than one-third before end; middle discocellular much shorter than the lower, more in a straight line than in *Rathinda*, vein 3 emitted some little distance before the lower end of the cell; wing short, triangular, costa gently arched, apex acute, outer margin even, slightly oblique. Antennæ less than half the length of the costa of forewing, gradually thickening to a pointed club.

Type, *Thecla onyx*, Moore.

HORAGA ONYX.

Plate 706, figs. 5, ♂, 5a, ♀, 5, b, ♂.

Thecla onyx, Moore, Cat. Lep. Mus. E.I.C. i. p. 30 (1857).

Horaga onyx, Moore, Proc. Zool. Soc. 1882, p. 247. de Nicéville, Butt. of India, iii. p. 416 (1890).

Elwes, Proc. Zool. Soc. 1892, p. 640. Swinhoe, Trans. Ent. Soc. 1893, p. 305. Mackinnon and de Nicéville, Journ. Bo. Nat. Hist. Soc. 1898, p. 387, pl. V, figs. 18a, 18b, larva.

IMAGO.—Male. Upperside cyaneous-blue. *Forewing* with a patch of white outside the end of the cell, divided into 4 by veins 2, 3 and 4, the upper piece the smallest, the spot below vein 4 small; the costa with a black band, narrow at the base, increasing in width outwards, occupying the whole apical space beyond the white patch, and broadly down the outer margin. *Hindwing* with the costal area broadly blackish, a narrow macular, outer marginal black band, terminal black line, anteciliary bluish-white thread; tails black, tipped with white. Cilia of both wings black, tipped with white on the hindwing and at the hinder angle of the forewing. Underside pale ferruginous-brown, with a pinkish-tint. *Forewing* with the hinder marginal space below the sub-median vein white, a broad white band with dark brown edges crossing the wing, from the white hinder space to near the costa, its inner edge passing just outside the end of the cell, fairly erect, somewhat sinuous, its outer margin inwardly oblique from vein 4, narrowing the upper end of the band to a point below the costa, terminal line dark brown. *Hindwing* with a narrower band in continuation, edged inwardly with dark brown, somewhat diffuse on its outer side, the band somewhat constricted in its middle, extending from the costa (where it is broadest) down to the first interspace, where it is angled and runs inwards in a straight black line, with some metallic blue-green spots on it; two similar spots below the angle, and three or four on the abdominal margin above the anal angle, a black anal spot, a black spot in interspaces 1 and 2, each with a metallic blue-green spot attached to it; marginal line dark brown, a white thread inside it. Cilia of both wings white, containing a medial brown line. Antennæ black, ringed with white; head and body above and below concolorous with the wings, abdomen whitish beneath and at the sides.

Female. Upperside paler and duller blue, the discal white patch on the forewing larger, more complete and usually oval-shaped. Underside as in the male but paler, and the white bands broader.

Expanse of wings, ♂ ♀ $1\frac{2}{10}$ to $1\frac{4}{10}$ inches.

LARVA, feeds on the leaves of *Coriaria nepalensis*, is shaped exactly like that of *viola*, Moore, and is furnished with the same number of processes, but the colour is different, some parts being green, and others brown.

PUPA, attached by the tail only, with no medial girth, is short and very thick for its length, anteriorly light green, the wing cases dark brown, the abdominal segments also brown, on the back of the sides and the body green. (Mackinnon and de Nicéville.)

HABITAT.—Northern India.

DISTRIBUTION.—The type is labelled "Himalayas." Elwes records it from the Karen Hills and Shan Hills; Mackinnon and de Nicéville from Mussuri; we have it from Sikkim and from the Khasia Hills; de Nicéville records it from Kulu, Deyra Doon, Kumaon, 3,200 feet elevation, the Pilebhit Terai, Jorehat Assam and Orissa.

HORAGA CINGALENSIS.

Plate 707, figs. 1, ♂, 1a, ♀, 1b, ♂.

Horaga cingalensis, Moore, Proc. Zool. Soc. 1883, p. 525. de Nicéville, Butt. of India, iii. p. 417 (1890). Manders, Journ. Bo. Nat. Hist. Soc. 1904, p. 78.

Horaga ciniata, Moore (nec Hewitson), Lep. Ceylon, i. p. 99, pl. 39, figs. 2, 2a, ♂ (1881).

Horaga onyx, Davidson, Bell and Aitken (nec Moore), Journ. Bo. Nat. Hist. Soc. 1896, p. 389.

IMAGO.—Male. Upperside of a brighter and clearer blue than in *H. onyx*, the outer margin more convex, the white patch usually smaller, not usually extending below vein 2, the black outer marginal border narrowing hindwards. *Hindwing* with the upper tail (at the end of vein 3), in all the specimens we have seen, very short, not half as long as it is in *onyx*. Underside, ground colour similar. *Forewing* with the margins of the white band more even, making the band somewhat bottle-shaped. *Hindwing* with the band narrower, straighter, not constricted at its middle, the anal markings somewhat similar, but the space between the anal black spot and the black spot in the first interspace is white, speckled with black atoms, there is an extra sub-terminal small black spot in the third interspace and each spot and mark in each interspace is capped with metallic blue-green scales. Antennæ, head and body as in *onyx*.

Female. Upperside dull bluish-grey. *Forewing*, with some blue scales on the basal portion; the white patch as in *H. onyx*. *Hindwing* with some white on the middle of the costa and a small suffused whitish space in the middle of the wing, the ground colour of the wing paler than it is on the forewing. Underside as in the male.

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

HABITAT.—South India, Ceylon.

DISTRIBUTION.—The type came from Ceylon; we have both sexes from Kandy and from Kanara; it is closely allied to *H. onyx*, but can always be recognized by the shortness of the tail at the end of vein 3.

HORAGA MOULMEINA.

Plate 707, figs. 2, ♂, 2a, ♀, 2b, ♂.

Horaga moulmeina, Moore, Proc. Zool. Soc. 1883, p. 525. de Nicéville, Butt. of India, iii. p. 418 (1890).

Horaga sikkima, Moore, Proc. Zool. Soc. 1883, p. 525. de Nicéville, Butt. of India, iii. p. 418 (1890). Swinhoe, Trans. Ent. Soc. 1893, p. 305. Watson, Journ. Bo. Nat. Hist. Soc. 1897, p. 667.

Horaga species, de Nicéville, Journ. As. Soc. Bengal, 1883, p. 235.

IMAGO.—Male. Upperside. *Forewing* with a white patch in the upper disc as in *H. onyx*, but not divided by the veins, its lower portion extending broadly below vein 2, the costal portion including the whole of the cell, all the space beyond the

white patch, and the outer margin (broadly) black, the small remaining portion of the wing cyaneous, a little darker than in *onyx*, the costa is longer, making the apex more produced. *Hindwing* with the costal space above the sub-costal vein, and a little below that vein outside the cell, black; the rest of the wing cyaneous with some darker irrorations towards the base, outer margin marked as in *onyx*; tail at the end of vein 3 as short as it is in that species. Underside paler than in *onyx* and of a clear ochreous-brown colour. *Forewing* with the white band extending upwards only a little beyond the sub-costal vein, not narrowing to a point near the costa as it does in *onyx*. *Hindwing* with the band similarly shaped, but narrower and without the metallic blue-green spots; a small black anal spot, a large black spot in the first interspace, with a metallic blue-green dot on it, the space between irrorated with black and a few white atoms, capped with pale blue-grey and then black thin lunules, the metallic blue-green markings of *onyx* not present.

Female. Upperside. *Forewing* with the white patch somewhat larger, the whole wing space black, except for the basal two-thirds below the median vein, which is dull dark cyaneous. *Hindwing* paler in colour, the upper part of the wing above the sub-costal vein and the basal half of the cell blackish, the rest of the wing dull dark cyaneous, all the veins from vein 4 hindwards black, the outer marginal markings much as in *onyx*, all the tails as long as they are in that species, and in both sexes are as usual black, tipped with white. Underside as in the male, but there are usually a few metallic blue-green small spots near the anal angle.

Expanse of wings, ♂ ♀ $1\frac{3}{10}$ to $1\frac{4}{10}$ inches.

HABITAT.—Assam, Sikkim, Bhutan, Burma.

DISTRIBUTION.—Watson records it from the Chin Hills, de Nicéville from Bhutan, we have received several examples of both sexes from the Khasia Hills, the type came from Maulmein, the type of *sikkima* from Sikkim.

HORAGA ALBIMACULA.

Plate 702, figs. 3, ♂, 3a, ♂.

Sithon albimacula, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1881, p. 249.

Horaga albimacula, de Nicéville, l.c. 1888, p. 284, pl. 14, fig. 9, ♂; id. Butt. of India, iii. p. 420, pl. 25, fig. 148, ♂ (1890).

IMAGO.—Male. Upperside. *Forewing* brown-black, of a vinous tint, with a large conspicuous oval white discal spot equal in length to half the breadth of the part of the organ on which it lies, equally distant from the opposite margins, and so placed that its major axis and more pointed anterior end are directed towards the middle of the costa. *Hindwing* dark violet-blue, bordered increasingly from the base of the anterior margin to the apical angle and thence decreasingly to the anal angle with fuscous

black, and from the sub-median nervure to the abdominal margin with greyish-black, with a fine black anteciliary line, and immediately internal to this a very faint and fine silvery-grey line decreasing from the anal angle and dwindling to nothing before reaching the apical angle, with the cilia dark brown, evenly tipped with silvery-white, and with the tails black-brown, the unequal sub-median and second median shorter ones edged internally with silvery-white cilia, and the longer intermediate first median one white-tufted at its inner extremity. Underside, both wings much lighter. *Forewing* with a broad and prominent white band bordered both sides with fuscous of a darker shade than the rest of the ground colour, passing off from the greyish-white basal portion of the inner margin across the organ to within a short distance of the costa, increasing in its course to a little beyond the first median nervule, and thence decreasing to its anterior extremity (which is washed with fuscous), so that its outline, while almost straight internally, is bluntly obtuse-angled externally, and with the outer margin at the inner angle obsoletely trilineated with white as in the hindwing. *Hindwing* with a narrower and less conspicuous discal whitish band of uniform width throughout, not sharply defined, but on the contrary diffused externally, and bordered internally with a line of fuscous which is darker than the ground, sharply bent inwards at right angles to itself to the abdominal margin and externally margined with brassy at the posterior end, with the deep black spot of the small anal lobe, a large grey patch of grey scales between the ends of the sub-median nervure and the first median nervule, an intense black spot next to and about half the size of this between the ends of the first and second median nervules, and a very short and transversely elongated or narrow similar but inconspicuous black spot between the ends of the first and second median nervules, all internally margined with a discontinuous line of brassy scales which extends from the point where the dark discal striga with its brassy edging reaches the abdominal margin all along the outer margin of the organs, following the inner contours of the above described spots, up to the second sub-costal nervule, and with the external margin finely lineated with three regularly concentric silvery-white lines separated from one another by the black anteciliary line and the brown bases of the cilia. (Wood-Mason and de Nicéville.)

Female unknown.

Expanse of wings, ♂ 1 to $1\frac{2}{10}$ inches.

HABITAT.—Andamans.

We have not seen this species; it is said to have no secondary sexual character; we give copies of de Nicéville's figure; it appears to be only separable from *H. rana*, de Nicéville, in having no sex mark.

HORAGA RANA.

Plate 707, figs. 4, ♂, 4a, ♀, 4b, ♂.

Horaga rana, de Nicéville, Journ. As. Soc. Bengal, 1888, p. 283, pl. 14, fig. 10, ♂ ; id. Butt. of India, iii. p. 417, pl. 25, fig. 149, ♂ (1890).

IMAGO.—Male. Upperside brownish-black. *Forewing* with some cerulean-blue scales on the basal half of the wing below the median nervure, faintly indicated in some examples, absent in others ; an oval discal white patch outside the cell, from vein 5 to vein 2, in some examples extending a little into the next lower interspace, the patch divided into three pieces by the veins. *Hindwing* somewhat paler than the forewing, a patch of cerulean-blue scales in the disc, varying in size in different examples ; tails black, tipped with white, the upper tail at the end of vein 3 rather short, abdominal fold pale. Underside, chocolate-brown. *Forewing* with a white transverse medial band right across the wing, edged on both sides with dark brown, its inner margin nearly straight, passing just outside the cell, its outer margin nearly erect to vein 4, then curving inwards, the band thus gradually narrowing to the costa which it does not quite touch ; a dark brown suffused space outside the upper part of the band. *Hindwing* with a narrow, transverse, white band in continuation of the band on the forewing, its inner margin edged with dark brown, slightly sinuous down to the sub-median vein, then curving inwards in a black line to the abdominal margin above the anal angle, with some metallic blue-green scales on the line, the outer margin of the white band diffuse.

Female. Upperside similarly brownish-black. *Forewing* with the white patch much larger, extending hindwards to near the hinder margin, with some blue scales on the basal half of the wing below the median vein. *Hindwing* without any markings, sometimes with some scattered blue scales in the disc. Underside a little paler in colour, the bands broader, the upper part of the band on the forewing slightly hooked. Antennæ black, ringed with white ; head and body black above, grey beneath.

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

HABITAT.—Andaman Islands.

We have it in our collection from Port Blair.

HORAGA VIOLA.

Plate 707, figs. 5, ♂, 5a, ♀, 5b, ♂.

Horaga viola, Moore, Proc. Zool. Soc. 1882, p. 248. de Nicéville, Butt. of India, iii. p. 419 (1890).

Mackinnon and de Nicéville, Journ. Bo. Nat. Hist. Soc. 1898, p. 388.

Horaga onyx, Hampson (nec Moore), Journ. As. Soc. Bengal, 1888, p. 358.

IMAGO.—Male. Upperside blackish-brown with a slight violet tint. *Forewing* with a somewhat oval white patch outside the cell, varying in size in different examples. *Hindwing* without markings, tails black, tipped with white, outer marginal line of both wings finely black. Undersider paler with a stronger violet tint. *Forewing* with the white patch continued to the hinder margin somewhat constricted at the sub-median vein. *Hindwing* with a black anal spot, another usually (but not always) in the first interspace and some obscure blackish spots in the others. Antennæ black, ringed with white; head and body above and below concolorous with the wings; no sex mark in the male.

Female. Upperside dull greyish-blue. *Forewing* with the white patch larger than it is in the male, costal black band rather broad, widening gradually from the base to the apex, filling up the whole apical space outside the white patch and broad down the outer margin to the hinder angle. *Hindwing* with the costal space broadly blackish, with a small white patch on the middle of the costa, the outer margin with a narrow, more or less macular black band, marginal line finely deep black, with an inner white thread. Underside as in the male.

Expanse of wings, ♂ ♀ 1 inch.

LARVA.—A single specimen from a larva found feeding in Mussuri on the leaves of *Coriaria nepalensis*. It is a most curious-looking creature, about half an inch long, of a reddish-brown colour, of the usual lycænid shape, but furnished with eleven tentacular processes, two on the third segment, one each on the fourth, seventh, eighth, and ninth segments, all dorsal, the fifth has three, two lateral and one dorsal, the eleventh has two lateral ones. (Mackinnon and de Nicéville.)

HABITAT.—India.

DISTRIBUTION.—The type came from Dharmsala, N.W. Himalayas; Mackinnon and de Nicéville record it from Mussuri and Sikkim; we have it from the Nilgiris, 3,500 feet elevation; it is a rare species, though widely distributed.

INDO-MALAYAN ALLIED SPECIES.

- Horaga lefevrei*, Sithon lefevrei, Felder, Wien Ent. Mon. vi. p. 291 (1862). Habitat, Philippines.
Horaga ciniata, Sithon ciniata, Hewitson, Ill. Diurn. Lep. p. 35, pl. 14, figs. 30, 31 (1863). Habitat, Celebes.
Horaga mænala, Sithon mænala, Hewitson, l.c. p. 7, pl. 3, figs. 85, 86 (1869). H. H. Druce, Proc. Zool. Soc. 1895, p. 612. Habitat, Borneo.
Horaga halba, Distant, Rhop. Malayana, p. 460, pl. 44, fig. 23 (1886). Habitat, Malay Peninsula
Horaga onychina, Staudinger, Iris, 1889, p. 113. Habitat, Java.
Horaga decolor, Staudinger, l.c. p. 112. Habitat, Philippines.
Horaga affinis, Staudinger, l.c. p. 113 (1889). H. H. Druce, Proc. Zool. Soc. 1895, p. 611, pl. 34, fig. 9, ♂. Frühstorfer, Berl. Ent. Zeit. 1898, p. 180. Habitat, Borneo, Nias.

- Horager anytus*, Staudinger, l.c. p. 113. Habitat, Java.
Horaga anara, Frühstorfer, l.c. p. 180. Habitat, Java.
Horaga camiguina, Semper, Rhop. Philipp. V. p. 216 (1890). Habitat, Mindanao, Philippines.
Horaga holothura, Swinhoe, Ann. Mag. Nat. Hist. 1894, p. 430. H. H. Druce, Proc. Zool. Soc. 1895, p. 611. Habitat, Java; Kina Balu, Borneo.

Sub-Family DEUDORIXINÆ.

Forewing triangular, costa arched, apex more or less acute, outer margin convex, oblique, hinder angle sub-acute, hinder margin straight; *with three sub-costal nervules*. *Hindwing* short produced hindwards, the wing slightly produced in a short angle at the end of vein 3, *a single filamentous tail* at the end of vein 2, and a well-developed anal lobe; in four genera with secondary sexual characters in the male, in six genera without them. The antennæ fairly long and slender, with a gradually formed club; the eyes are hairy in all the genera but two; in four genera in the forewing vein 11 is strongly bowed towards 12 and nearly anastomoses with it; in six genera vein 11 is free from 12. The coloration on the upperside is generally dark brown tinged more or less with blue, in a few it is orange, or scarlet red; on the underside the colour is in various shades from brown to yellow. The different genera may be tabulated in the following order:—

1. Forewing, vein 11 bowed towards 12, sexual characters, eyes hairy	.	.	{ <i>Sinthusa</i> , Moore. <i>Hysudra</i> , Moore. <i>Araotes</i> , de N. <i>Bindahara</i> , de N.
1a. Forewing, 11 free from 12, no sexual characters, eyes hairy	.	.	{ <i>Lehera</i> , Moore. <i>Deudorix</i> , Hew.
1b. Forewing, 11 free from 12, with sexual characters, eyes hairy	.	.	{ <i>Rapala</i> , Moore. <i>Virachola</i> , Moore.
1c. Forewing, 11 free from 12, no sexual characters, eyes naked	.	.	{ <i>Zinaspa</i> , de N. <i>Drina</i> , de N.

Genus SINTHUSA.

Sinthusa, Moore, Journ. As. Soc. Bengal, 1884, p. 33. Distant, Rhop. Malayana, p. 461 (1886); de Nicéville, Butt. of India, iii. p. 483 (1890). Leech, Butt. of China, etc. ii. p. 394 (1893).

Eyes very hairy. *Forewing*, vein 12 terminates on the costa beyond the upper end of the cell, 11 emitted at two-thirds from the base, and is bowed upwards towards 12, which it almost touches for some distance; 10 from about one-fifth before the end, 9 short, from 7 beyond its middle, discocellulars nearly straight, upright, the

lower the longer, vein 6 emitted from near the upper end, 5 from a little above the middle, 4 from lower end of cell, somewhat bowed, 3 from a little before the lower end, 2 from about the middle, wing short, costa arched at base, apex rather acute, outer margin convex, hinder margin bulged out just before the middle in the male, and has a tuft of hairs attached to the margin and turned upwards. *Hindwing* with vein 7 arched, emitted from the middle of cell, which is broad, triangular and half the breadth of the wing; discocellulars oblique, of equal length, vein 6 from upper end of the cell, 5 from the middle of discocellulars, 3 from very near the lower end, 2 from the middle, a small anal lobe and a short filamentous tail at the end of vein 2, the male with an oval glandular patch below the costa extending hindwards into the cell.

Type, *Thecla nasaka*, Horsfield.

SINTHUSA NASAKA.

Plate 708, figs. 1, ♂, 1a, ♀, 1b, ♂.

Thecla nasaka, Horsfield, Cat. Lep. E.I.C. p. 91 (1829).

Deudorix nasaka, Hewitson, Ill. Diurn. Lep. p. 24, pl. 5, figs. 45, 46, ♂ (1863).

Hypolycæna nasaka, Moore, Proc. Zool. Soc. 1882, p. 249. de Nicéville, Journ. As. Soc. Bengal, 1883, p. 77, pl. 9, fig. 2, ♀.

Sinthusa nasaka, Moore, Journ. As. Soc. Bengal, 1884, p. 34. de Nicéville, Butt. of India, iii. p. 484 (1890). Elwes, Proc. Zool. Soc. 1892, p. 644. Mackinnon and de Nicéville, Journ. Bo. Nat. Hist. Soc. 1898, p. 389.

IMAGO.—Male. Upperside blue-black. *Forewing* with the outer margin very broadly black, the blue merging into the black, but in certain lights a broad even black outer marginal band occupying a third of the wing is visible. *Hindwing* with the basal and abdominal areas pale, in certain lights there is a black streak below the basal area and another on the outer side of the abdominal area, and on the veins; tail black, tipped with white; terminal line black. Cilia black, except between the tail and the anal lobe, where it is white, tipped with black. Underside grey, markings a little darker than the ground colour, edged with white. *Forewing* with a line closing the cell, a discal, slightly outwardly curved line of lunules from near the costa to below the sub-median vein. *Hindwing* with a thin bar across the end of the cell, a discal band of thicker lunules passing close outside the cell bar, the third lunule outside the others, the lower portion of the series indented and curving inwards to the abdominal margin; a double sub-marginal series of small lunular marks, all capped with bluish-white, a black anal spot, a larger one in the first interspace, both capped with pale orange, a pale orange line between them; terminal line on both wings black, with a white inner thread on the lower half of the hindwing. Antennæ black, ringed with white; head and body above concolorous with the wings, white below.

Female. Upperside somewhat glossy brown. *Forewing* somewhat paler internally. *Hindwing* with the abdominal fold pale, some black sub-marginal lunular spots capped with white, the spot in the first interspace larger and more conspicuous than the others, the white caps in some examples are large, in one example from Java the lower fourth of the wing is bluish-white. Underside as in the male, the ground colour paler and the markings more prominent.

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

HABITAT.—Himalayas, Sikkim, Assam, Java.

DISTRIBUTION.—A widely distributed species from the Himalayas to Java, but never common, varying somewhat in colour and markings on the upperside, especially in the females; the type came from Java, we have it from Preanga, and both sexes from Shillong; Elwes records it from Margharita in Upper Assam, Mackinnon and de Nicéville from Mussuri, de Nicéville from Sikkim, Kangra and Kulu; it is in the B. M. also from Ranikhet and the Khasia Hills.

SINTHUSA CHANDRANA.

Plate 708, figs. 2, ♂, 2a, ♀, 2b, ♂.

Hypolycæna chandrana, Moore, Proc. Zool. Soc. 1882, p. 249, pl. 11, figs. 2, 2a, ♂. de Nicéville,

Journ. As. Soc. Bengal, 1883, p. 78, pl. 9, fig. 1, ♀.

Chliaria chandrana, Moore, Journ. As. Soc. Bengal, 1884, p. 33.

Sinthusa chandrana, de Nicéville, Butt. of India, iii. p. 486 (1890). Elwes, Proc. Zool. Soc. 1893, p. 645. Leech, Butt. of China, etc. ii. p. 395 (1893). Mackinnon and de Nicéville, Journ. Bo. Nat. Hist. Soc. 1898, p. 389.

Hypolycæna grotei, Moore, Proc. Zool. Soc. 1883, p. 527, pl. 49, fig. 5, ♂.

Sinthusa grotei, Moore, Journ. As. Soc. Bengal, 1884, p. 34. Swinhoe, Trans. Ent. Soc. 1893, p. 307.

Thecla pratti, Leech, Trans. Ent. Soc. 1889, p. 110, pl. 7, fig. 4, ♂; id. Entom. xxiii. p. 44 (1890); id. Butt. of China, etc. ii. p. 354, pl. 30, fig. 10, ♂ (1893).

IMAGO.—Male. Upperside, dark violet-brown, shading darker towards the outer margin. *Hindwing* with the costal area dark, the rest of the wing showing more violet colour in certain lights; anal lobe black, with a pale blue mark on it, terminal line black, abdominal area pale. Underside grey, markings darker grey with prominent white edgings. *Forewing* with a broad bar at the end of the cell, a discal band of six broad, square, conjoined spots, the first two from the costa, slightly outwardly oblique, the next four in a slightly outwardly curved band decreasing in size hindwards to the sub-median vein, its upper ends touching the lower ends of the first two spots and of the discoidal bar. *Hindwing* with a sub-basal black spot below the costa, and two spots below it, one above the other, both inside the cell, the upper one small; a thick bar, constricted in its middle, a discal band of similar sized spots in four pieces, the

first composed of two conjoined spots from the costa, the lower inner end touching the upper outer end of the discoidal bar, the next piece of two conjoined spots outwardly curved, the upper inner end touching the lower outer end of the spots above; the third piece composed of two conjoined spots, the upper ends touching the lower ends of the spots above them and of the discoidal bar, the last piece in a very acute angle to the abdominal margin, with a spot on the margin above it; both wings with a sub-marginal series of angular lunules, with a series of minute lunular marks between it and the margin on the hindwing, a small anal black spot, a large one in the first interspace, capped with orange, with a white edge on its outer side and a very small dark spot ringed with white in the interspace between the two black spots.

Female. Upperside blackish-brown. *Forewing* with the central part pale. *Hindwing* with a black outer marginal line and an inner white thread; anal lobe with an orange spot in it. Underside paler than the male, markings similar. Antennæ black, ringed with white; head and body above and below concolorous with the wings; eyes ringed with white.

Expanse of wings, ♂ ♀ 1 to $1\frac{3}{10}$ inches.

HABITAT.—Himalayas, Burma, Sikkim, Assam, China.

DISTRIBUTION.—Recorded by de Nicéville from Dehra Dhun, Sikkim and Tsenbo, Upper Burma, by Elwes from the Karen Hills, by Mackinnon and de Nicéville from Mussuri; we have both sexes from the Khasia Hills; it is in the B. M. also from Kangra; the type of *pratti* is in the B. M. from Foochow, and also examples from Kiukiang in China.

SINTHUSA AMBA.

Plate 708, figs. 3, ♂, 3a, ♀, 3b, ♂.

Hypolycaena amba, Kirby, in Hewitson's Ill. Diurn. Lep. Suppl. p. 32, pl. 5b, figs. 44, 46, ♂; 45, ♀ (1878).

Sinthusa amba, Distant, Rhop. Malayana, p. 461, pl. 44, figs. 12, ♂, 19, ♀ (1886). Doherty, Journ. As. Soc. Bengal, 1889, p. 427. de Nicéville, Butt. of India, iii. p. 485 (1890). Elwes, Proc. Zool. Soc. 1892, p. 644.

IMAGO.—Male. Upperside purple-brown. *Forewing* flushed with purple in the middle. *Hindwing* of a brighter purple, the costal space and abdominal fold pale brown, the purple of the wing is edged with black towards the costa, and hindwards it extends in a narrow detached streak just outside the anal spot, edged on both sides with black; anal lobe black, with some blue scales on it, and a small orange spot on its inner side. Cilia and tails black, the latter tipped with white. Underside grey with a bluish tint, shading darker towards the margins; markings ochreous-grey. *Forewing* with a double line at the end of the cell, a post-medial, almost straight band of oval marks, with orange centres. *Hindwing* with a double line at the end of the

cell; an outwardly curved irregular band of short, double, linear marks, which curves in on to the abdominal margin above the anal angle; a black anal spot, a larger black spot in the first median interspace, some blue scales in the interspace between them, all capped with a continuous band of orange and outwardly lined with white, some indistinct sub-marginal double markings above them. Antennæ black, ringed with white; club with an orange tip; frons white, collar finely white; head and body above and below concolorous with the wings.

Female. Upperside brown, with a rufous tint. *Forewing* with the colour shading darker towards the outer margin. *Hindwing* with the lower half bluish-white, anal spot black, a small black spot in each of the next three interspaces, terminal line black. Underside as in the male.

Expanse of wings, ♂ ♀ $\frac{9}{10}$ to 1 inch.

HABITAT.—Mergui, Burma, Malay Peninsula.

DISTRIBUTION.—The types came from the Myitta, Tenasserim and Mergui; Elwes records it from Eastern Pegu, Distant from the Malay Peninsula; our descriptions and figures are from Burmese examples in the B. M.

SINTHUSA VIRGO.

Plate 708, figs. 4, ♂, 4a, ♀, 4b, ♂, 4c, ♀.

Hypolycæna virgo, Elwes, Proc. Zool. Soc. 1887, p. 446.

Hypolycæna (? *Sinthusa*) *virgo*, Elwes, Trans. Ent. Soc. 1888, p. 396, pl. 8, fig. 7, ♀.

Sinthusa virgo, de Nicéville, Butt. of India, iii. p. 488, frontispiece, fig. 134, ♂ (1890). Elwes, Proc. Zool. Soc. 1892, p. 645.

IMAGO.—Male. Upperside, both wings shining light blue. Cilia white, but becoming dusky towards the apex of the forewing, tipped with black on the anal lobe. *Forewing* with the costa as far as the costal nervure, the outer margin broadly, the apex still more broadly, black. *Hindwing* with the costa very broadly black, the abdominal margin whitish, an anteciliary fine black line, the veins outwardly more or less broadly bordered with black; tail black, tipped with white. Underside, both wings bluish-white, an indistinct sub-marginal dusky band, a discal macular broken ochreous band outwardly defined finely with black, a short similar band on the discocellular nervules. *Forewing* with the discal band composed of three distinct portions, the upper composed of three spots, the middle of two, which are shifted a little inwards, the lower portion of one spot also shifted inwards, placed in the sub-median interspace. *Hindwing* with the discal band composed of three pairs of spots from the costa, then three or four single spots recurved to the abdominal margin; the inner portion of the sub-marginal band bearing a bright yellow line from the second median nervule to the abdominal margin, the anal lobe black, a small round

black spot on the margin in the first median interspace surrounded with brilliant metallic blue scales, a few of these scales in the sub-median interspace. Body black above, bluish-white below. (de Nicéville.)

Female. Upperside. *Forewing* black, with a large discal patch of French-grey extending to the hinder margin inwardly. *Hindwing* grey, powdered with black, and becoming dull black on the costal margin, with a single narrow black tail, tipped with white, and a small fuscous lobe at the anal angle. Cilia white, narrow towards the apex of the forewing. Underside, both wings bright French-grey. *Forewing* with a distinct transverse sinuous yellowish band, narrowly edged with black on both sides about two-thirds of the length, not extending quite to the hinder margin; a short double-lined bar at the end of the cell, and an indistinct outer band near the edge. *Hindwing* with similar bands, of which the first extends in the usual broken W to the inner margin, and in addition a short band of three blackish spots within the discal bar; at the anal angle two blue spots, of which the outer is half black. Antennæ ringed with black and white, with a fuscous tip to the club; body above black, with grey hairs, pale grey beneath. (Elwes.)

Expanse of wings, ♂ $1\frac{3}{10}$, ♀ $1\frac{4}{10}$ to $1\frac{5}{10}$ inches.

HABITAT.—Sikkim.

DISTRIBUTION.—The types came from Sikkim, Elwes records it also from the Naga Hills; we have not seen the species, and therefore give copies of de Nicéville's and Elwes' figures.

INDO-MALAYAN ALLIED SPECIES.

Sinthusa malika, *Thecla malika*, Horsfield, Cat. Lep. E.I.C. p. 90 (1829). Horsfield and Moore, Cat. Lep. Mus. E.I.C. i. p. 37, pl. 1a, fig. 5 (1857). de Nicéville, Journ. As. Soc. Bengal, 1894, p. 43, pl. 5, figs. 18, ♂, 6, ♀. Habitat, Java, Sumatra, Nias.

Sinthusa amata, Distant, Rhop. Malayana, p. 461, pl. 44, fig. 20, ♀ (1886). Habitat, Penang, Borneo.

Sinthusa peregrinus, Staudinger, Lep. Pal. p. 111, pl. i. fig. 11, ♂ (1889). Habitat, Philippines.

Sinthusa verriculata, *Deudorix verriculata*, Snellen, Tijds. voor Ent. xxxiv. p. 257, pl. 15, fig. 3 (1892). Habitat, Celebes.

Sinthusa aspra, Doherty, Journ. As. Soc. Bengal, 1891, p. 180. de Nicéville, id. 1894, p. 44, pl. 5, fig. 17, ♂. Habitat, Mt. Arjuno, East Java.

Sinthusa verena, Grose-Smith, Nov. Zool. ii. p. 514 (1895). Habitat, Celebes.

Genus HYSUDRA.

Hysudra, Moore, Proc. Zool. Soc. 1882, p. 250. de Nicéville, Butt. of India, iii. p. 453 (1890).

Eyes very hairy. *Forewing*, vein 12 ends on costa opposite upper end of cell, 11 emitted from upper two-thirds of the cell, is bowed upwards, almost touching 12 in

the male, well separated in the female, 10 from three-fourths, 9 from 7 at one half, discocellulars nearly upright, very slightly outwardly oblique, both slightly concave, the lower the longer; vein 6 from upper end of cell, 5 from near lower end of upper discocellular, 4 from lower end of cell, bowed; 3 from before the end, 2 from one-fourth before the end; costa nearly straight, slightly curving inwards beyond the middle, outer margin convex, hinder margin straight, without the usual long tuft of hairs turned upwards from near the base in the male as in so many allied genera. *Hindwing*, vein 8 very short, not nearly reaching the apex of the wing, discocellulars of nearly equal length, straight and outwardly oblique, vein 3 emitted just before lower end of cell; a semicircular glandular patch of scales in the male, above and touching the sub-costal nervure, its outer edge not reaching the origin of the first sub-costal nervule; costa arched at base, apex rounded, outer margin slightly convex, a moderate-sized anal lobe, and slender tail at the end of vein 2, of moderate length. Antennæ slender, with a well-formed club.

Type, *Deudorix selira*, Moore.

HYSUDRA SELIRA.

Plate 709, figs. 1, ♂, 1a, ♀, 1b, ♂.

Deudorix selira, Moore, Proc. Zool. Soc. 1874, p. 272.

Hysudra selira, Moore, Proc. Zool. Soc. 1882, p. 250. Doherty, Journ. As. Soc. Bengal, 1886, p. 126. de Nicéville, Butt. of India, iii. p. 454, pl. 29, fig. 240, ♂ (1890). Mackinnon and de Nicéville, Journ. Bo. Nat. Hist. Soc. 1898, p. 388. Leslie and Evans, id. 1903, p. 675.

Deudorix nissa, Hewitson (part, nec Kollar), Ill. Diurn. Lep. p. 23, pl. 10, fig. 44, ♂ (nec figs. 42, 43), (1863).

IMAGO.—Male. Upperside brown, with a slight bluish tint. *Forewing* with a large sub-quadrate orange patch in the upper disc, generally limited hindward by the sub-median vein, its upper part narrower and more or less rounded, its side margins somewhat irregular. *Hindwing* with a rather broad outer marginal orange band, narrowing upwards, its inner margin irregular, with the brown veins running through it; tail brown, tipped with white; anal lobe orange; outer marginal line blackish-brown. Cilia orange-grey. Underside orange-grey. *Forewing* with the orange patch showing through the wing; a thin pale brown discal band or thick line, slightly outwardly curved and outwardly edged with pale whitish. *Hindwing* with a similar discal band which is sinuous and curves inwards with two blunt angles on to the abdominal margin; anal lobe black, capped with orange-white; a black spot in the first interspace, capped with orange; a pale brown marginal line with a white thread inside it, and indications of a double sub-marginal band. Antennæ black, ringed with white; head and body above and below concolorous with the wings; abdomen below white; eyes ringed with white.

Female, only differs from the male in having the orange patch on the forewing above, and the black anal spots on the hindwing below, larger.

Expanse of wings, ♂ ♀ $1\frac{2}{10}$ to $1\frac{4}{10}$ inches.

HABITAT.—Western Himalayas, Kashmir.

DISTRIBUTION.—Recorded by Mackinnon and de Nicéville from Mussuri, by Leslie and Evans from Chitral, by Doherty from Kumaon, 4,600 feet elevation; we have both sexes from Kulu and Kashmir; it is in the B. M. also from Thundiani, Kangra, Dana, Goorais Valley, Narkundah and Dharmsala.

HYSUDRA HADES.

Plate 709, figs. 2, ♂, 2a, ♀, 2b, ♂.

Hysudra (?) hades, de Nicéville, Journ. Bo. Nat. Hist. Soc. 1895, p. 318, pl. P, fig. 46, ♂; id. Journ. As. Soc. Bengal, 1897, p. 560, pl. 4, fig. 29, ♀.

IMAGO.—Male. Upperside, both wings shining fuscous. *Forewing* with a large dull coppery-red area occupying the middle of the wing crossed by the black veins and bearing a black streak outwardly on the sub-median fold; this red area just enters the outer end of the discoidal cell and occupies the basal portion of the lower discoidal, median, and sub-median interspaces. *Hindwing* streaked between the veins more or less by the same dull coppery-red. Underside, both wings pale fawn-colour, the discocellular nervules marked by a rather broad and prominent paler line. *Forewing* with a macular outwardly curved discal fuscous band, commencing at the costa, ending close to the sub-median nervure; an obsolete marginal dark fascia. *Hindwing* with a discal fuscous band as on the forewing, but more prominent, outwardly defined with white, posteriorly somewhat ferruginous, and recurved to the abdominal margin in a W-shaped figure; a marginal series of four dark lunules from the first sub-costal to the second median nervule, a marginal oval black spot faintly crowned with orange in the first median interspace, a clump of black and white scales in the sub-median interspace; the anal lobe black, faintly crowned with orange, with a narrow orange fascia running along the abdominal margin from above the anal lobe to the termination of the discal band; tail black, tipped with white. Antennæ with the shaft black, annulated with white; the club black, the tip ferruginous; body black above and fawn-coloured below. I place this species in the genus *Hysudra* with considerable doubt, but do so because the coloration of the upperside is very similar to that of *H. selira*, Moore, from the Western Himalayas, and the markings of the underside are almost identical. The tail, however, is twice as long as in *H. selira*; as far as I can see, however, by the application of benzine to my unique specimen, it does not possess the characteristic male "scale mark" of the genus *Hysudra*, but instead has that portion of the sub-costal nervure between the point where the first sub-costal nervule arises and the apex

of the discoidal cell distinctly swollen and free of, or covered with, colourless scales in the sub-costal interspace immediately anterior to the point where the first sub-costal nervule arises. Without bleaching the wing of a specimen it is difficult to define these characters accurately. The species may be a *Deudoria*, it is certainly not a *Rapala*, as it does not possess a tuft of hairs on the inner margin of the forewing, or a scale-mark on the costa of the hindwing, which are characteristic features of that genus. Described from a single specimen in my collection. (de Nicéville, Journ. Bo. Nat. Hist. Soc. 1895, p. 318.)

Female. Upperside, both wings hair-brown with a distinct gloss in some lights. Cilia cinereous. *Forewing* somewhat paler on the disc. *Hindwing* with the costal and abdominal margins somewhat paler than the rest of the surface, the anal lobe bearing a small obscure black and dull ochreous spot. Underside, both wings grey, of a paler shade than in the male, but all the markings precisely the same.

Described from two examples in my collection. (de Nicéville, Journ. As. Soc. Bengal, 1897, p. 560.)

Expanse of wings, ♂ $1\frac{5}{10}$, ♀ $1\frac{5}{10}$ to $1\frac{7}{10}$ inches.

HABITAT.—Burma.

DISTRIBUTION.—Daunat Range, Tenasserim.

We have not seen this species, it is not represented in the B. M., we therefore give copies of de Nicéville's figures.

CHINESE AND JAPANESE ALLIED SPECIES.

Hysudra micans, *Thecla micans*, Bremer and Grey, Schmett. N. China's, p. 9 (1853). *Rapala micans*, Leech, Butt. of China, etc. p. 414. Habitat, China.

Hysudra cœrulea, *Thecla cœrulea*, Bremer and Grey, l.c. p. 8. Ménétrés, Cat. Mus. Petr. part i. pl. 4, fig. 4 (1855). Habitat, China.

Hysudra arata, *Thecla arata*, Bremer, Lep. Ost-Sib. p. 25, pl. 3, fig. 6 (1864). Pryer, Rhop. Nippon, p. 15, pl. 4, fig. 10 (1887). *Rapala arata*, Leech, l.c. p. 416 (1893). Synonym, *Thecla ichnographia*, Butler, Journ. Linn. Soc. Zool. Lond. 1866, p. 57. Habitat, China, Japan, Corea.

Hysudra tyrianthina, *Thecla tyrianthina*, Butler, Ann. Mag. Nat. Hist. 1881, p. 34, pl. 4, fig. 5. Habitat, Japan.

Hysudra betuloides, *Thecla betuloides*, Butler, l.c. fig. 2. Leech, l.c. p. 415, pl. 27, fig. 13, ♂. Habitat, Kiukiang.

Genus ARAOTES.

Araotes, Doherty, Journ. As. Soc. Bengal, 1889, p. 413. de Nicéville, Butt. of India, iii. p. 445 (1890).

Eyes hairy. *Forewing*, vein 12 sinuous, ends on costa opposite the upper end of the cell, 11 emitted at two-thirds the length of the cell, is bent towards 12, almost touching it for a short distance, 10 from three-fourths, 9 from 7 from its middle,

running very close to 7 ; discocellulars upright, slightly concave, vein 3 from a little before the lower end of cell, costa slightly curved, apex rounded, outer margin somewhat convex, hinder margin straight. *Hindwing*, discocellulars very straight, of equal length, outwardly strongly oblique ; vein 3 emitted some little distance before lower end of the cell ; costa evenly curved, outer margin straight to the end of vein 3, where there is a small angle, a long narrow filiform tail at the end of vein 2, in the male shorter than in the female, in which sex it is ciliated or fluffy, a well-developed, narrow anal lobe. Male without secondary sexual characters.

Type, *Myrina lapithis*, Moore.

ARAOTES LAPITHIS.

Plate 709, figs. 3, ♂, 3a, ♀, 3b, ♂.

- Myrina lapithis*, Moore, Cat. Lep. Mus. E.I.C. i. p. 48 (1857). Hewitson, Ill. Diurn. Lep. p. 36, pl. 15, figs. 35, 36, ♂, 37, 38, ♀ (1863). Butler, Trans. Linn. Soc. Zool. 1877, p. 549.
Sithon lapithis, Druce, Proc. Zool. Soc. 1873, p. 351.
Biduanda lapithis, Distant, Rhop. Malayana, p. 238, pl. 20, fig. 29, ♀ (1884). Moore, Journ. Linn. Soc. Zool. 1886, p. 42. Doherty, Journ. As. Soc. Bengal, 1886, p. 260.
Araotes lapithis, de Nicéville, Butt. of India, iii. p. 446, pl. 29, fig. 237, ♂ (1890). Elwes, Proc. Zool. Soc. 1892, p. 642.

IMAGO.—Male. Upperside. *Forewing* black, the hinder basal two-thirds of the wing below the median vein dark blue, brilliant in certain lights. *Hindwing* with the whole of the wing brilliant dark blue, the abdominal fold blackish ; the long anal lobe black ; tail black, tipped with white, with a few metallic blue-green scales at its root. Cilia black. Underside. *Forewing* ochreous-red, a black, outwardly oblique band from the outer end of the cell to the sub-median vein and from thence suffusedly to the hinder margin ; another similar band, its upper end from the median vein close to the upper end of the other band, inwardly oblique forming a Λ -shape, the space inside them pure white ; a discal thin band or thick, somewhat irregular line, broken at vein 4, then recommencing a little outwardly ; terminal line black. *Hindwing* white, a broad ochreous-red marginal band from the costa, terminating abruptly a little below vein 4, the white space covered with large black spots and marks, a bar across the middle of the cell, another a little before its end with a spot above it ; a discal well curved series of spots, composed of a spot outside the upper end of the cell, a curved bar a little outwards, opposite the end of the cell, two attached spots, slightly outwardly oblique, and three detached spots in a line on to the abdominal margin above its middle, a large V-shaped mark below them in an outwardly oblique form, the upper end of its outside portion touching the outer of the three spots in a line ; anal lobe black with some pale blue scales above it, a black sub-terminal spot in the first interspace, capped with pale metallic blue, which is a part of a lunular band of metallic blue scales all

capped with black, which runs from the abdominal margin a little above the anal angle to near the apex, narrowing upwards, marginal line black. Antennæ black, ringed with white; head and body above concolorous with the wings, white beneath.

Female. Upperside brown. *Forewing* with the inner area suffused with red. *Hindwing* darker brown, a patch of white above the anal angle, with some light blue scales near the margin in the first three interspaces; anal lobe black; an anteciliary fine black thread. Underside. *Forewing* with the ochreous-red colour paler. *Hindwing* with the outer margin narrowly marked with some ochreous-red suffusion, spots and markings as in the male, but usually smaller.

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

HABITAT.—Sikkim, Chittagong Hill Tracts, Burma, Mergui, Malay Peninsula, Java, Borneo, Nias.

DISTRIBUTION.—We have it from Nias, Elwes records it from the Karen Hills, de Nicéville from Sikkim, Rangoon, and Yimiki, King Island, Mergui Archipelago, Distant from the Malay Peninsula, Druce from Borneo, Doherty from Myitta, Burma and Barakhal in the Chittagong Hill Tracts; he says the egg is small, green, with tetragonal reticulations and short truncate spines, and also that the male prehensores are remarkable in having the short clasps soldered to the long intromittent organ; though widely distributed, the species is always scarce. The type came from Maulmein, it is in the B. M. also from Pegu; our description and figures are from examples from the Karen Hills.

INDO-MALAYAN ALLIED SPECIES.

Araotes perrhaebis, Semper, Rhop. Philipp. p. 220, pl. 33, fig. 21, ♂ (1890). Habitat, Philippines.

Genus BINDAHARA.

Bindahara, Moore, Lep. Ceylon, i. p. 111 (1884). Distant, Rhop. Malayana, p. 247 (1884).
de Nicéville, Butt. of India, iii. p. 471 (1890).

Eyes hairy. *Forewing*, vein 12 ends on the costa opposite the end of the cell, 11 emitted from about the middle of the cell, is bent upwards and almost touches 12 for a short distance, 10 from two-thirds, 9 from the middle of 7; discocellulars upright, slightly concave, the lower the longer, 6 from a little below the end, 5 from the middle of discocellulars, cell broad, 4 from the lower end, 3 from some little distance before the end, 2 from the middle; wing short, triangular, costa much arched at the base, outer margin oblique, hinder margin convex in its middle and furnished with a tuft of hair in the male; in the female the inner margin is straight. *Hindwing*, vein 7 emitted from the middle of the cell, discocellulars oblique, cell broad, vein 3 from a little before the lower end, 2 from the middle; wing short, attenuated hindwards and produced into a very long tail from the end of vein 2, highly ciliated and broad at its

base, anal angle lobed, outer margin sinuous towards the tail; a large, well defined glandular patch in the male, almost quadrate, but with its two upper ends a little rounded, placed anterior to the discoidal cell and covers the base of vein 2. The female has the wings broader and shorter than the male, the apex of the forewing less acute, the outer margin convex, not straight, the hindwing much less produced hindwards, the tail shorter.

Type, *Hesperia phocides*, Fabricius.

BINDAHARA PHOCIDES.

Plate 709, figs. 4, ♂, 4a, ♀, 4b, ♂.

Hesperia phocides, Fabricius, Ent. Syst. iii. (1), p. 282, ♀ (1793).

Papilio phocides, Donovan, Nat. Hist. Rep. ii. pl. 44, fig. 1, ♀ (1834).

Myrina phocides, Butler, Cat. Fabr. Lep. B. M. p. 183 (1869).

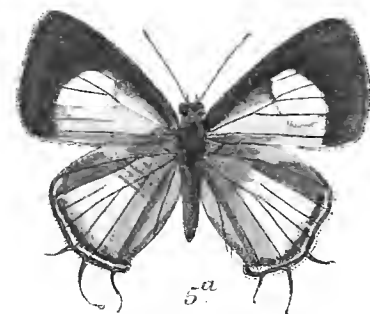
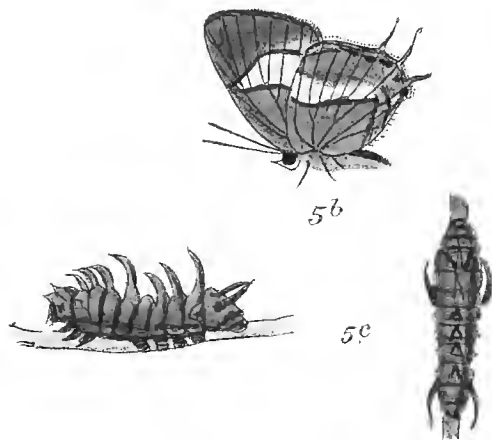
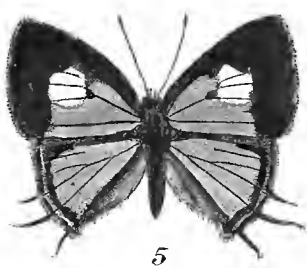
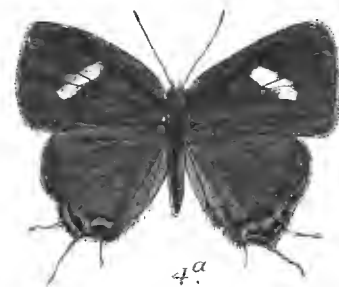
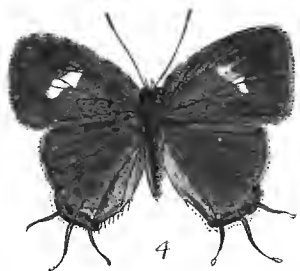
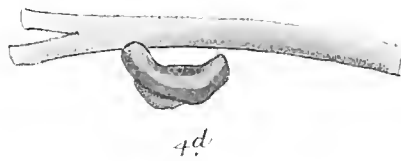
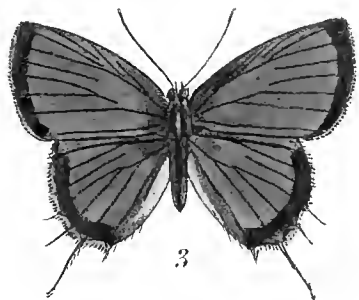
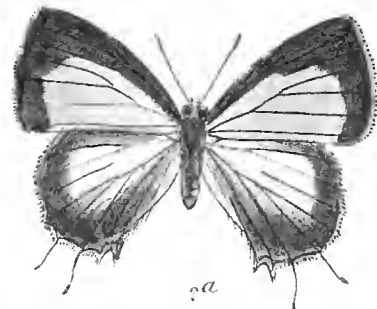
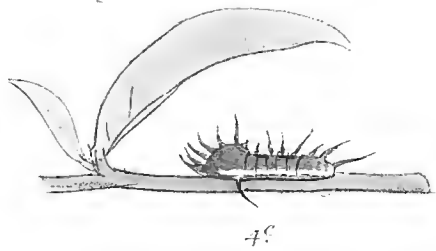
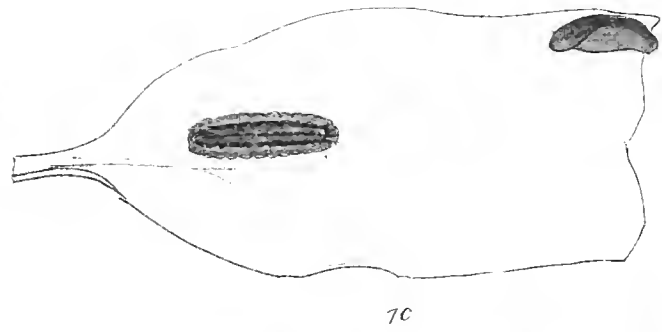
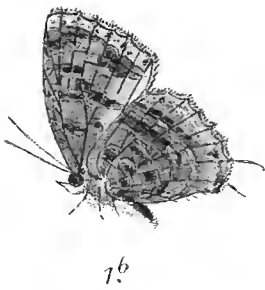
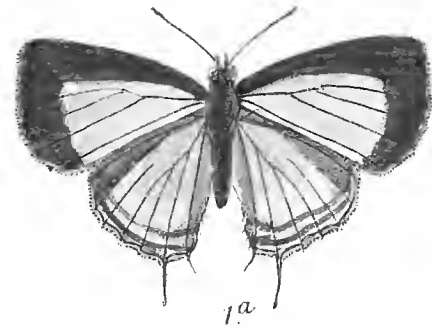
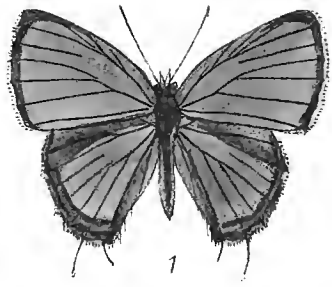
Bindahara phocides, Distant, Rhop. Malayana, p. 247, pl. 20, fig. 25, ♀ (1884). de Nicéville, Butt. of India, iii. p. 473 (1890). Swinhoe, Trans. Ent. Soc. 1893, p. 307.

Rapala phocides, Elwes, Proc. Zool. Soc. 1892, p. 644.

Sithon sugriva var. *areca*, Wood-Mason and de Nicéville (nec Felder), Journ. As. Soc. Bengal, 1880, p. 232, and 1881, p. 249.

Sithon sugriva, Manders (nec Horsfield), Trans. Ent. Soc. 1890, p. 530.

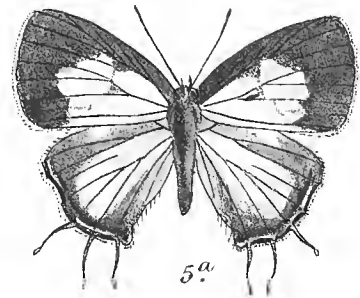
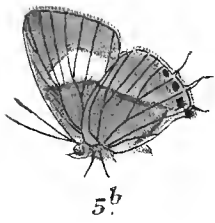
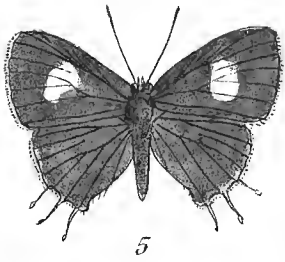
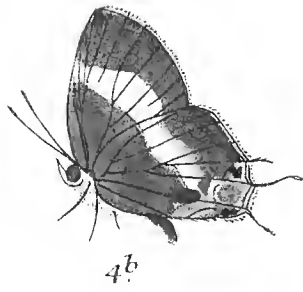
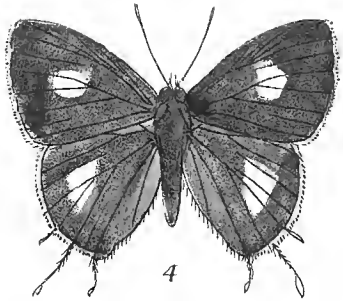
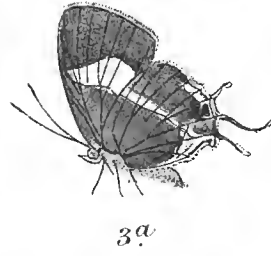
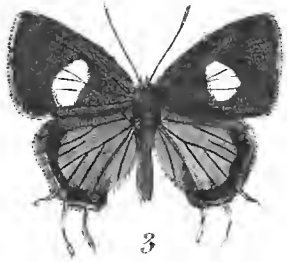
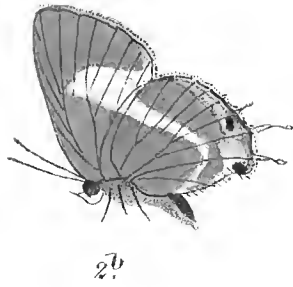
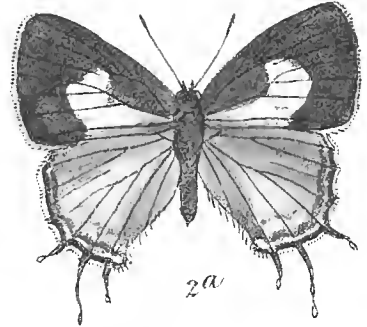
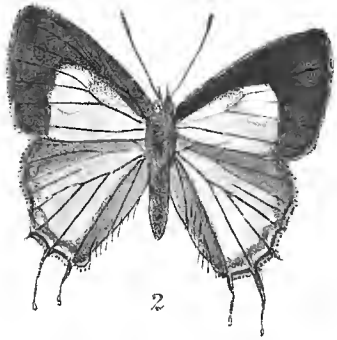
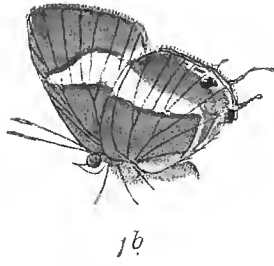
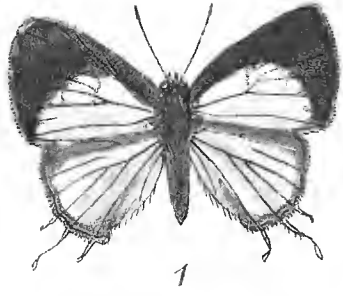
IMAGO.—Male. Upperside dark fuliginous-brown. *Forewing* without markings. *Hindwing* with the tail, anal lobe, and a small anal patch dull ochreous; a small indistinct spot on the anal lobe. Underside pale ochreous-brown. *Forewing*, a black spot at the base of the cell, a dark brown, broad, outwardly curved band with irregular ochreous edges, from the costal nervure to a little below the median vein, crossing the cell somewhat beyond its middle, with pale indications of its continuation hindwards, a pale brown line, edged on both sides with ochreous at the end of the cell; a dark brown, broad discal band, from the costa to a little below the sub-median vein, composed of conjoined squarish spots, the first four outwardly oblique, the others commencing a little inwards nearly straight down the wing, narrowing gradually hindwards; indications of a pale brown, sub-marginal, double series of lunular marks. *Hindwing* with a basal blackish-brown spot, a larger one immediately below the costal vein, two smaller ones in a line below it, two conjoined spots closing the cell, a discal very irregular band, commencing from the costal vein where there is a large square blackish-brown spot attached to it below, half outwards is a similar spot, with a smaller blackish-brown spot attached to its lower side half outwards; these are followed by a curiously formed series of five small paler spots, the first well outside, a parallel pair below it and another similar pair below and inwards; then there is an indistinct pair below these joined on the inner side to a heart-shaped pale spot with brown edges, with a curving sinuous brown line attached, which bends inwards and upwards near

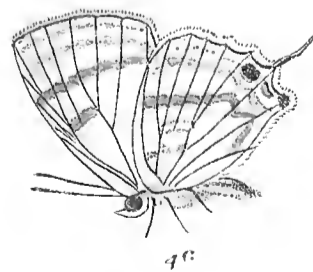
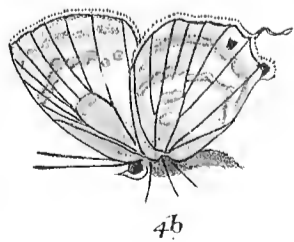
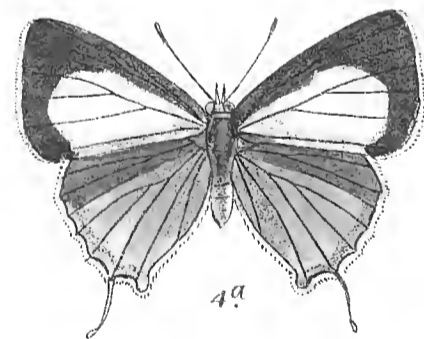
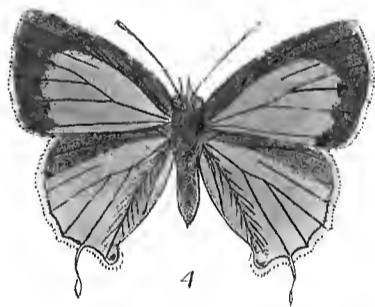
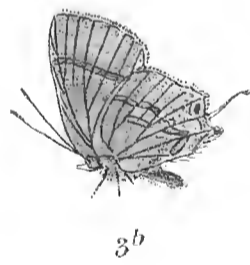
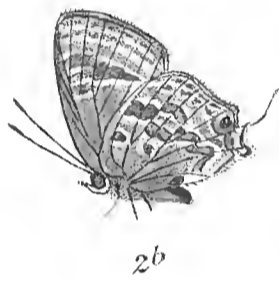
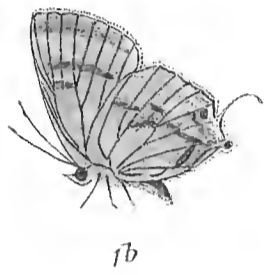
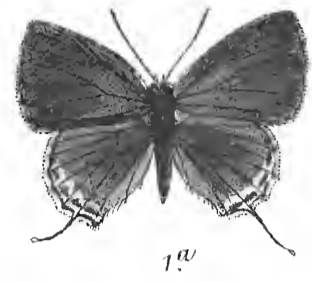


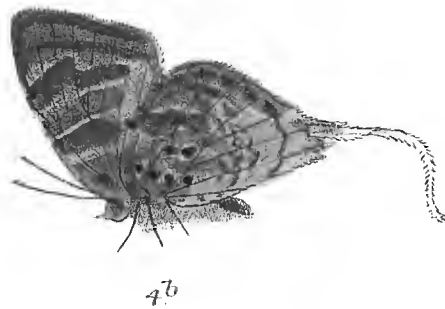
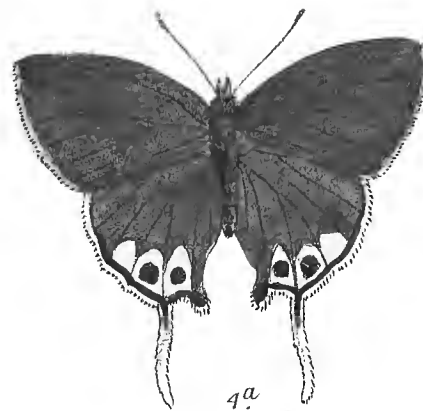
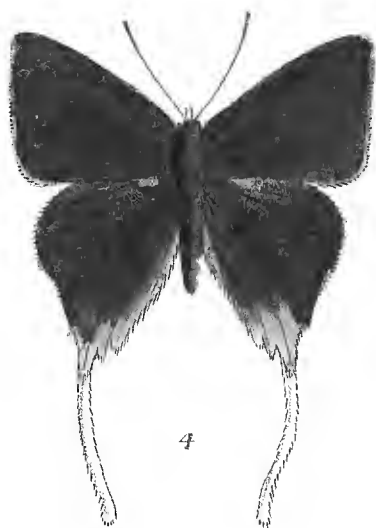
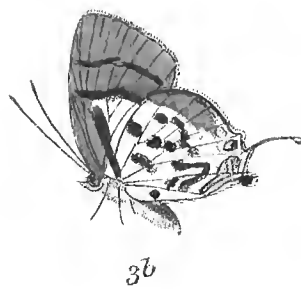
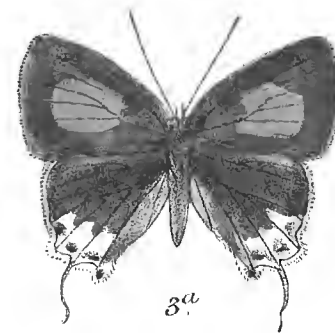
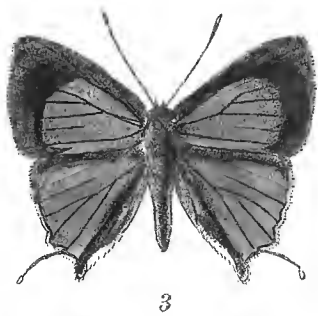
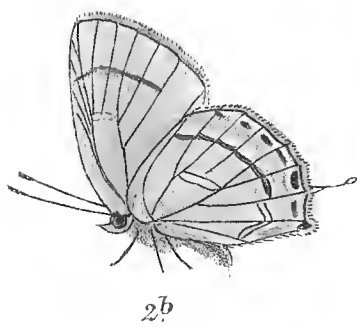
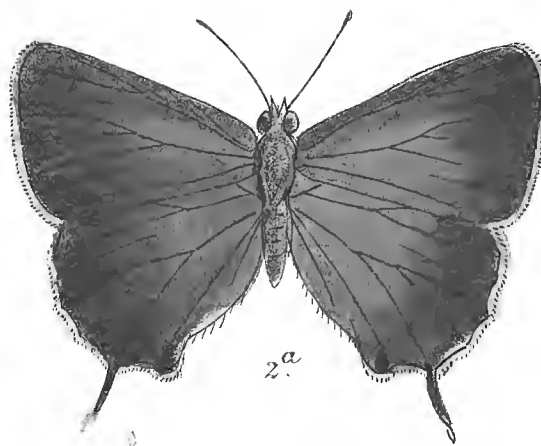
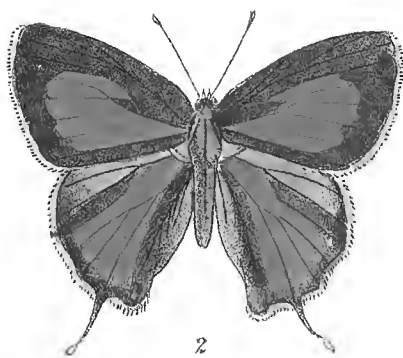
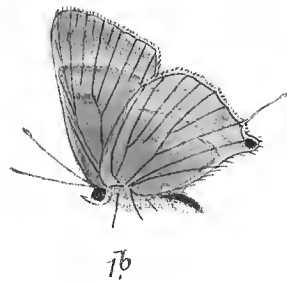
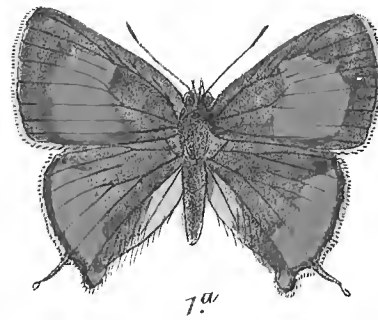
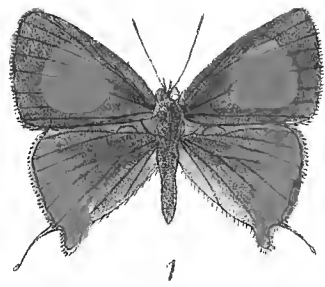
J.N.Fitch del.et lith.

Vincent Brooks, Day & Son Lith'rs.

L.Reeve & Co London.







LOVELL REEVE & CO.'S PUBLICATIONS—*Continued.*

The Narcissus, its History and Culture, with Coloured Figures of all known Species and Principal Varieties. By F. W. BURBIDGE, and a Review of the Classification by J. G. BAKER, F.L.S. Super-royal 8vo, 48 Coloured Plates, 30s.

British Grasses; an Introduction to the Study of the Gramineæ of Great Britain and Ireland. By M. PLUES. Crown 8vo, with 16 Coloured Plates and 100 Wood Engravings, 7s. 6d.

British Ferns; an Introduction to the Study of the FERNS, LYCOPODS, and EQUISETA indigenous to the British Isles. With Chapters on the Structure, Propagation, Cultivation, Diseases, Uses, Preservation, and Distribution of Ferns. By M. PLUES. Crown 8vo, 16 Coloured Plates, and 55 Wood Engravings, 7s. 6d.

The British Ferns; Coloured Figures and Descriptions, with Analysis of the Fructification and Venation of the Ferns of Great Britain and Ireland. By Sir W. J. HOOKER, F.R.S. Royal 8vo, 66 Coloured Plates, 36s.

Garden Ferns; Coloured Figures and Descriptions of a Selection of Exotic Ferns, adapted for Cultivation in the Garden, Hothouse, and Conservatory. By Sir W. J. HOOKER, F.R.S. Royal 8vo, 64 Coloured Plates, 36s.

Filices Exoticæ; Coloured Figures and Description of Exotic Ferns. By Sir W. J. HOOKER, F.R.S. Royal 4to, 100 Coloured Plates, £6 11s.

Handbook of British Mosses, containing all that are known to be natives of the British Isles. By the Rev. M. J. BERKELEY, M.A., F.L.S. 24 Coloured Plates, 21s.

Synopsis of British Mosses, containing Descriptions of all the Genera and Species (with localities of the rare ones) found in Great Britain and Ireland. By CHARLES P. HOBKIRK, F.L.S. New Edition, entirely revised. Crown 8vo, 6s. 6d.

British Fungi, Phycomycetes and Ustilagineæ. By GEORGE MASSEE. 8 Plates, 6s. 6d.

British Fungology. By the Rev. M. J. BERKELEY, M.A., F.L.S. Re-issue with a Supplement of nearly 400 pages by Worthington G. Smith, F.L.S., bringing the work up to the present time. 2 vols. 24 Coloured Plates, 36s.

The Esculent Funguses of England. Containing an Account of their Classical History, Uses, Characters, Development, Structure, Nutritious Properties, Modes of Cooking and Preserving, &c. By C. D. BADHAM, M.D. Second Edition. Edited by F. CURREY, F.R.S. 12 Coloured Plates, 12s.

The Uses of British Plants. Traced from Antiquity to the Present Day, together with the Derivations of their Names. By the Rev. Prof. G. HENSLOW, M.A., F.L.S. With 288 Illustrations. Crown 8vo, 4s. 6d.

The Potamogetons of the British Isles: Descriptions of all the Species, Varieties and Hybrids. By ALFRED FRYER. Illustrated by ROBERT MORGAN, F.L.S. Sections 1-3, each 21s. Coloured; 15s. uncoloured.

Phycologia Britannica; or, History of British Seaweeds. By Dr. W. H. HARVEY, F.R.S. New Edition. Royal 8vo, 4 vols. 360 Coloured Plates, £6 6s.

Phycologia Australica; a History of Australian Seaweeds, Comprising Coloured Figures and Descriptions of the more characteristic Marine Algæ of New South Wales, Victoria, Tasmania, South Australia, and Western Australia, and a Synopsis of all known Australian Algæ. By Dr. W. H. HARVEY, F.R.S. Royal 8vo, Five Vols., 300 Coloured Plates, £6 10s.

British Seaweeds; an Introduction to the Study of the Marine ALGÆ of Great Britain, Ireland, and the Channel Islands. By S. O. GRAY. Crown 8vo, with 16 Coloured Plates, 7s. 6d.

West Yorkshire; an Account of its Geology, Physical Geography, Climatology, and Botany. By J. W. DAVIS, F.L.S., and F. ARNOLD LEES, F.L.S. Second Edition, 8vo, 21 Plates, many Coloured, and 2 large Maps, 21s.

Natal; a History and Description of the Colony, including its Natural Features, Productions, Industrial Condition and Prospects. By HENRY BROOKS, for many years a resident. Edited by Dr. R. J. MANN, F.R.A.S., F.R.G.S., late Superintendent of Education in the Colony. Demy 8vo, with Maps, Coloured Plates, and Photographic Views, 18s.

St. Helena. A Physical, Historical, and Topographical Description of the Island, including its Geology, Fauna, Flora, and Meteorology. By J. C. MELLISS, A.I.C.E., F.G.S., F.L.S. In one large Vol., Super-royal 8vo, with 56 Plates and Maps, mostly coloured, 36s.

The Structure and Life History of the Cockroach (*Periplaneta Orientalis*). An Introduction to the Study of Insects. By L. C. MIALI, Professor of Biology in the Yorkshire College, Leeds, and ALFRED DENNY, Lecturer on Biology in the Firth College, Sheffield. Demy 8vo, 125 Woodcuts, 7s. 6d.

LOVELL REEVE & CO., LTD., 6, HENRIETTA STREET, COVENT GARDEN.

LOVELL REEVE & CO.'S PUBLICATIONS—*Continued.*

- Monographiæ Entomologicæ. I. A Monograph of the genus TERACOLUS. By E. M. BOWDLER SHARPE. Parts 1-11, 4to, with Four Coloured Plates, 7s. 6d. each.
- Monographiæ Entomologicæ. II. A Monograph of the MEMBRACIDÆ. By GEORGE BOWDLER BUCKTON, F.R.S., F.L.S. 4to, with 60 Coloured Plates, £6 15s.
- Foreign Finches in Captivity. By ARTHUR G. BUTLER, Ph.D., F.L.S., F.Z.S., F.E.S. Complete in One Vol., royal 4to, with 60 Coloured Plates, £4 14s. 6d.
- The Lepidoptera of Ceylon. By F. MOORE, F.L.S. Three Vols., Medium 4to, 215 Coloured Plates, cloth, gilt tops, £21 12s. Published under the auspices of the Government of Ceylon.
- The Butterflies of Europe; Illustrated and Described. By HENRY CHARLES LANG, M.D., F.L.S. Complete in Two Vols., super-royal 8vo, with 82 Coloured Plates, containing upwards of 900 Figures, cloth, £3 18s.
- The Hemiptera Heteroptera of the British Islands. By EDWARD SAUNDERS, F.L.S. Complete in 1 vol. Small Edition, with a Structural Plate, 14s. Large Edition, with 31 Coloured Plates, 48s.
- The Lepidoptera of the British Islands. By CHARLES G. BARRETT, F.E.S. Complete in 11 vols., £6 12s. Large Paper Edition, with 504 Coloured Plates, £33 15s.
- The Larvæ of the British Lepidoptera, and their Food Plants. By OWEN S. WILSON. With Life-sized Figures drawn and coloured from Nature by ELEANOR A. WILSON. 40 Coloured Plates, 63s.
- The Coleoptera of the British Islands. By the Rev. Canon FOWLER, M.A., F.L.S. Complete in Five Vols. Large Edition, with 180 Coloured Plates, £14. Small Edition, with Two Structural Plates, £4.
- Catalogue of British Coleoptera. By D. SHARP, M.A., F.R.S., and Rev. Canon FOWLER, M.A., F.L.S. Price 1s. 6d.
- The Hymenoptera Aculeata of the British Islands. By EDWARD SAUNDERS, F.L.S. Complete with 3 Plates, 16s. Large Paper Edition, with 49 Coloured Plates, 68s.
- The Hemiptera Homoptera of the British Islands. By JAMES EDWARDS, F.E.S. Complete with a structural plate, 14s. Large Edition, with 31 Coloured Plates, 48s.
- British Insects. A Familiar Description of the Form, Structure, Habits, and Transformations of Insects. By E. F. STAVELEY, Author of "British Spiders." Crown 8vo, with 16 Coloured Plates and numerous Wood Engravings, 7s. 6d.
- British Beetles; an Introduction to the Study of our indigenous COLEOPTERA. By E. C. RYE. Second Edition, revised and in part rewritten by the Rev. Canon FOWLER, M.A., F.L.S. Crown 8vo, 16 Coloured Steel Plates, and 11 Wood Engravings, 7s. 6d.
- British Butterflies and Moths; an Introduction to the Study of our Native LEPIDOPTERA. By H. T. STANTON. Crown 8vo, 16 Coloured Plates, and Wood Engravings, 7s. 6d.
- British Bees; an Introduction to the Study of the Natural History and Economy of the Bees indigenous to the British Isles. By W. E. SHUCKARD. Crown 8vo, 16 Coloured Plates and Woodcuts of Dissections, 7s. 6d.
- British Spiders; an Introduction to the Study of the ARANEIDÆ found in Great Britain and Ireland. By E. F. STAVELEY. Crown 8vo, 16 Coloured Plates and 44 Wood Engravings, 7s. 6d.
- Curtis's British Entomology. Illustrations and Descriptions of the Genera of Insects found in Great Britain and Ireland, containing Coloured Figures, from Nature, of the most rare and beautiful Species, and in many instances, upon the plants on which they are found. Eight Vols., Royal 8vo, 770 Coloured Plates, £24.
- Harvesting Ants and Trap-door Spiders; Notes and Observations on their Habits and Dwellings. By J. T. MOGGRIDGE, F.L.S. With SUPPLEMENT, 17s. The Supplement separately, cloth, 7s. 6d.
- Elements of Conchology; an Introduction to the Natural History of Shells, and of the Animals which form them. By LOVELL REEVE, F.L.S. Royal 8vo, Two Vols., 62 Coloured Plates, £2 16s.
- Conchologia Iconica; or, Figures and Descriptions of the Shells of Mollusks, with remarks on their Affinities, Synonymy, and Geographical Distribution. By LOVELL REEVE, F.L.S., and G. B. SOWERBY, F.L.S., complete in Twenty Vols., 4to, with 2727 Coloured Plates, half-calf, £178. A detailed list of Monographs and Volumes may be had.
- The Edible Mollusca of Great Britain and Ireland; with the Modes of Cooking them. By M. S. LOVELL. Crown 8vo, with 12 Coloured Plates. New Edition, 7s. 6d.
- British Zoophytes; an Introduction to the Hydroida, Actinozoa, and Polyzoa found in Great Britain, Ireland, and the Channel Islands. By ARTHUR S. PENNINGTON, F.L.S. Crown 8vo, 24 Plates, 7s. 6d.
- Handbook of the Freshwater Fishes of India; giving the Characteristic Peculiarities of all the Species at present known, and intended as a guide to Students and District Officers. By Capt. R. BEAVAN, F.R.G.S. Demy 8vo, 12 Plates, 10s. 6d.

LOVELL REEVE & CO., LTD., 6, HENRIETTA STREET, COVENT GARDEN.

14-6041